

THE POLAR TIMES



Ellsworth Mountains

January 2015



President's Message

Dear Fellow American Polar Society members:

A belated Merry Christmas and Happy New Year to you all! I hope that each and every one of you and your families had a safe and happy holiday season.

As I am sure you are aware, we have an important year ahead. If all goes well with our preparations, The American Polar Society will be fully ready for its 80th Anniversary Symposium, titled "The Polar Oceans and Global Climate Change." The symposium is scheduled to take place at the beautifully situated Scripps Institution of Oceanography (SIO) in La Jolla, California, from the 3rd to the 6th of November 2015. Joining us as co-sponsor will be the SIO, thanks to its dynamic and most gracious new Director, Dr. Margaret Leinen. By then our officers will have completed assembling some 15 of the top authorities in the world to address all facets of this extremely important subject. Invitation acceptances to date include: Mr. Norman Augustine, retired CEO of Lockheed-Martin and former head of the President's Commission on the Antarctic; Dr. Lawson Brigham, Distinguished Professor of Geography and Arctic Policy; Dr. Sylvia Earle, famed ocean environmentalist; sea ice expert Dr. Peter Wadhams of Cambridge University; Dr. Julian Dowdeswell, Director of the Scott Polar Research Institute; Dr. Claire Parkinson, Senior Scientist at NASA, and two distinguished professors from the SIO, Dr. Lynne Talley and Dr. Walter Munk.

By the time you read this, you should already have received the symposium agenda, with details on the sessions and speakers and information on the welcoming cocktail party and grand banquet. You will also have learned about the rooms available at two very conveniently located

hotels, the La Jolla Shores Hotel (within walking distance) and the Hotel La Jolla (which will run a shuttle to the SIO), and learned much about the general beauty of the entire seaside location in La Jolla.

During this year's truly international and world-class two-day symposium, significant new knowledge will be revealed. There will be ample time to ask questions and mingle with the speakers and other participants including members of the press. Please make every effort to attend and participate. Register on our web site and make your hotel reservations today. You won't regret it!

One final piece of news: I will be stepping down as your President immediately following the symposium. It is therefore time to begin thinking who you will want to lead APS in the future. The forthcoming symposium should amply demonstrate what our Society is capable of as we step forward to play our role in educating our fellow world citizens, especially the youth of all nations, in what must be done to adapt successfully to global warming and climate change as we, at the same time, make every effort to mitigate its worst effects.

I look forward to seeing everyone at the symposium in November.

President, APS

Membership Letter

Greetings from the coast of Maine! Snow is on the ground, days get dark early, and the leaves are all down. Must be time to wrap up the 2014 American Polar Society membership year. As your APS membership chair, I sent out over 400 yearly renewals in October and had a pretty good immediate return rate from those who chose to continue their membership with us. Thank you for your prompt attention to that.

Many responded with checks or money orders sent to our Post Office box in Searsport, Maine. Many others renewed electronically through the PayPal service. Others are getting around to it as renewals continue to trickle in.

Our membership is currently over 700 individuals and institutions from around the United States and all over the world, all of whom share an affinity for the polar regions. It is a vast and varied group, and I am honored to be your membership chair. In addition to your regular mailing address, most of you have provided an email address for us to more easily keep in touch with you. If you have not, please consider doing so. Also, please continue to advise us of any changes with your contact and mailing information. Have a great 2015! Cheers!

Charles Lagerbom
APS Membership Chair

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American Polar Society

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Transits of the Northwest Passage

by Robert K. Headland and John Splettstoesser

A new feature of *The Polar Times* appears in the January 2015 issue, a result of the many years of compilation of transits of the Northwest Passage of Canada. The background for this addition is explained in the July 2014 issue (see p. 20) in which the transits for the more recent year will appear in the January issue, in this case for 2014 (included with this article). For 2014, 10 transits were made by a variety of vessels, numbering 211 through 220, supplementing the entire list of transits beginning with Roald Amundsen in 1903-06. An earlier list was published by Pullen and Swithinbank (1991) in *Polar Record*, 27(163):363-367, which included 44 transits through 1990, followed by a list through 2009 by Headland in *Polar Geography*, v. 33, Issue 1-2, p. 1-13.

The entire list is now available on the American Polar Society website under the "Polar Compendium" link (<http://www.americanpolar.org/polar-compendium/>). The article also includes the prefatory information that explains the seven routes taken through the Passage, labeling each as to



Russian Icebreaker Kapitan Khlebnikov carrying tourists in Northwest Passage, summer 1992. The ship rammed the ice, stopped, then retreated to provide a second approach on strong ice. Note the meltwater pools on top of sea ice and ship helicopter, quite small in upper right, doing ice surveillance.

whether it was east to west or vice versa, a map showing the routes, and related material.

The website list will remain unchanged,

as succeeding transits for 2015 and later will appear in upcoming January issues of *The Polar Times*.

(CONTINUED ON PAGE 4)

2014 Transits of the Northwest Passage

Year	Vessel	Flag	Master	Route
2014				
211	<i>Altan Girl</i> (13.4 m motor vessel)	Canada ⁴⁷	Erkan Gursoy Single handed voyage ⁸ , rescued by USCG Healy off Point Barrow, assisted by <i>Tandberg Polar</i> through Bellot Strait	East 6
212	<i>Arctic Tern</i> (13.1 m sloop)	Britain ²⁰	Leslie Parsons	West 6
213	<i>Drina</i> (16.8 m ketch)	Australia ⁵	Michael Thurston	West 6
214	<i>Lady Dana 44</i> (14.3 m sloop)	Poland ⁴	Ryszard Wojnowski Circumnavigated the Arctic ⁹	East 6
215	<i>Latitude</i> (44.5 m motor yacht)	Cayman Islands ⁹	Sean Meagher	West 6
216	<i>Le Boréal</i> (cruise vessel)	France ¹⁶	Etienne Garcia ² Carried passengers ⁴⁷	West 3
217	<i>Novara</i> (18.3 m schooner)	Britain ²¹	Stephen Brown	West 6
218	<i>Nunavik</i> (ice-strengthened bulk cargo vessel)	Marshall Islands ³	Randy Rose Conveyed 23 000 tonnes of nickel concentrate to China	West 2
219	<i>Silver Explorer</i> (cruise vessel)	Bahamas ²⁴	Alexander Golubev Carried passengers ⁴⁸ , assisted by CCGC <i>Pierre Radison</i> in Victoria Strait	West 5
220	<i>Triton</i> (50 m motor vessel)	Marshall Islands ⁴	Paul Jones	East 6

An examination of the transits through time and the routes taken are an indication of ice conditions during each year, normally summer, and, as further compilations are made, the list will indicate what satellite and other information already reveal—that climate change is reducing the amount of ice and its thickness in the Arctic Ocean, at least when averaged for the past few decades. The number of variables are many, however, and such a list cannot be used as a basis for predictions. The type of vessel (icebreaker, yacht, cruise vessel, commercial vessel, etc.) will normally seek the easiest, safest and most efficient route in a particular year. Starting in 1992, the first year that the *Kapitan Khlebnikov* made a transit of the Northwest Passage, it has made a total of 17 transits, the most number of any vessel.

What Headland's lists do not include are the numerous attempts for a complete transit in which vessels were forced to return or became trapped in ice, the most famous being that of the expedition by Sir John Franklin in 1845-46, in which Franklin and the ships *Erebus* and *Terror* entered the passage on the eastern side and cruised a short distance to Beechey Island, where the ships and crew overwintered before proceeding further, ultimately becoming trapped in ice and lost. Three graves of the crew from Franklin's expedition are on that island (see photo). Their progress was enlightened by reports of native Eskimos, but the exact location of the ships and 128 crew remained a mystery until a relic of a ship was discovered near King William Island in 11 meters of water by a team from Parks Canada in



Graves from Franklin's expedition, 1845-46, on Beechey Island.

2014. Careful examination showed it to be the *Erebus*. An article with a sonar image of the ship can be found on the American Polar Society website under "News" (<http://www.americanpolar.org/2014/10/17/arctic-wreck-found-after-169-years/>). An update to the "News" account of the discovery, which was a result of the Victoria Strait Expedition, provides details of the team effort that involved several ships and organizations, including the ship *One Ocean Voyager/Akademik Sergei Vavilov*, operated by Canadian-based One Ocean Expeditions.

Cruise tourism of the Northwest Passage began in 1984 with the passage from east to west by the *Lindblad Explorer* and has become a popular annual event since then. Many of the tour vessel transits enjoy

the traditional entertainment that accompanies each cruise, sung by the staff and passengers: a recording of a multi-verse song by late Canadian musician Stan Rogers that is a tribute to Franklin's expedition and others who have voyaged in this once remote region. The following website—<https://www.youtube.com/watch?v=TVY8LoM47xI>—will lead you to a moving rendition of the song by Rogers, or you can search for his name and "Northwest Passage" to find several options. Turn up the volume and enjoy. A second website—<http://rockgenius.com/Stan-Rogers-northwest-passage-lyrics>—contains the lyrics to the song, which is generally considered to be the unofficial Canadian anthem. ¶

Intergovernmental Panel on Climate Change 2014 Report

Read it and wonder!

by Cliff Bekkedahl

No matter where you place yourself along the spectrum of the greenhouse gas/climate change controversy, you will find little to nothing by way of comfort or solace in this report.

If you are a true believer, the bogey of reducing CO₂ emissions to the level of 400-500 PPM and a consequent capping of the average global temperature rise to 2°C or less by year 2100 is nigh impossible, given the resource requirements and political hurdles involved. How could anyone muster a shred of optimism that the United Nations or any other coalition could organize and fund such effort, which essentially would drastically alter the energy production, transportation, building, and

agriculture industries of all the world's economies?

An unlikely happening.

If you are not a total believer but far from a "denier," the report is a tsunami of facts, details, slippery opinions, charts and graphs, special definitions, "probabilities" and dense prose, all brought to you by 243 scientist/authors, 66 reviewing editors and 436 contributing authors from 70 countries. Try your luck at posing questions or exploring contradictory notions about global warming with this crowd!

Stand in the way of this steamroller and you'll get run over and flattened paper thin. ¶

Northwest Passage by Motor Yacht

On the 'Latitude,' August/September 2014

Article and photos by Captain Patrick R. M. Toomey, Canadian Coast Guard (retired) and ice pilot, Ilulissat, Greenland, to Nome, Alaska

On the evening of 20 September 2014, the 47-metre steel motor yacht (m/y) *Latitude* arrived at the port of Nome, Alaska, at the end of her first—and probably only—transit of the Northwest Passage, one of only four westbound yachts to succeed in 2014. Having departed Newport, Rhode Island, in the middle of July, her owner, who was aboard for the full voyage from Newport to Vancouver, British Columbia, had not intended taking more than about 25 days to make the actual passage, but, for the first time in five years, the ice conditions turned out to be something like what was considered “normal” only a few years ago.

The original plan called for the vessel to be in Nome by the end of August, but it was soon demonstrated that “Arctic planning” is merely a mathematical exercise, subject to change at short notice. It was quite a contrast for the owner, guests, and crew to have come from summer conditions in New England, to proceed via Halifax, Nova Scotia, and St. John's, Newfoundland, to cruise along the Labrador coast and eventually cross over to Greenland. By then everyone on board was completely out of their natural element. The first icebergs had appeared, but the open, bergy water beckoned them on. “Where’s all the pack ice?” they asked—a little too soon. *Latitude* called at several Greenland ports as everyone on board became acclimatised to what seemed to them the “bitter cold” of a Greenland summer, on their way to Ilulissat, the jumping-off point for the Northwest Passage.

The ice pilot (myself) was to join in Ilulissat. Even though there was the possibility of difficult ice in the entry to the port, this seemed to be the obvious place to get serious about ice navigation. Getting to Ilulissat by air from North America is not easy, so the two-day journey from Toronto to Ilulissat



Latitude and the Everglades steel tender at Resolute Bay, Cornwallis Island.

included visits to Copenhagen in Denmark and Kangerlussuaq in Greenland.

On my arrival at Ilulissat, I found the port to be packed full of ice that extended a good fifteen miles offshore, the product of a continuous large outflow of icebergs and brash from the Jakobshavns Isfjord nearby. Having visited Ilulissat for the last four consecutive summers

and finding these identical ice conditions each time, I am now convinced that this situation, which used to be rare, is the new norm for the Disko Bay region and should be taken into consideration

when planning any voyage that includes a visit to Ilulissat.

Latitude had already arrived offshore, but could not get into port because of the ice—and I, the ice pilot, was ashore, unable to board. After one day's wait, the ice moved out of the inner harbour, and the local fishing boats resumed their complicated transits through the ice to the open-water fishing grounds, which activity was observed

by *Latitude* at the ice-edge. It was decided to send their powerful 12-metre Everglades steel tender through the ice and into the harbour to pick me up by following a fishing boat back to her berth. The 12-mile trip took almost four hours before I and three late-arriving guests were picked up by the tender at the Ilulissat fishing harbour and transported back by roughly the same route to *Latitude*, hove-to at the ice edge. The trip back to the ship took almost as long, as the ice had moved around with the tide, so that much of the track was lost. Half the trip was done in the dark—but I, the intrepid ice pilot, earned my keep from the very beginning, starting with piloting the tender back to the ice-edge, then moving up in scale to bring in *Latitude* herself the following day—another four-hour effort.

Latitude remained in Ilulissat for a couple of days, awaiting spare parts and seeing the sights, finally departing on 15 August to embark on the major adventure of a westbound transit of the Northwest Passage. On a ship that small, “weather windows” are of great importance for ocean crossings. The next relatively calm opportunity to cross Baffin Bay was forecast for 16 August, so a side trip in more sheltered waters to Umannaq Fjord via the Vaigat was decided upon to

The 12-mile trip took almost four hours before I and three late-arriving guests were picked up by the tender at the Ilulissat fishing harbour and transported back by roughly the same route to *Latitude*, hove-to at the ice edge.



Polar bear family on drift ice, Prince Regent Inlet, Nunavut.

occupy the day of waiting. That spare day turned out to be the worst of the storm, as 60-knot winds funneling down Ummannaq Fjord prevented any visit to either Ummannaq or Qilakitsoq sites as planned, so *Latitude* cruised slowly through the maze of fjords, icebergs, and craggy scenery, to arrive at an unexpectedly sheltered overnight anchorage at the tiny village of Ukkusissat, which was not even marked on the charts—we had to go ashore to discover its name.

Next day we found that the weather window had indeed opened, so *Latitude* set off to cross Baffin Bay to Scott Inlet, Baffin Island, which, at 10 knots maximum speed towing the tender, took 36 hours in rapidly improving weather, with only a few icebergs to keep the look-outs on their toes. The first polar bear was sighted high on the hillside of Scott Island within minutes of entering the inlet, a very good start to the Canadian portion of the voyage. After touring Scott, Clarke and Gibbs fjords, *Latitude* moved to Sam Ford Fjord in glorious weather, prior to proceeding to Pond Inlet for clearance into Canada and the first excursion ashore.

The cruise along the Devon Island coast ... and also Radstock Bay [brought] sightings of ringed seals, harp seals, several more polar bears, walrus, bowhead whales—and four sperm whales swimming slowly westwards. These stopped for almost an hour to play with our tender at the end of its towline.

On arrival at the Pond Inlet anchorage, there were only a couple of small sail yachts already anchored, but the anchorage filled up in the next few days with HMCS *Kings-ton*, a mine-warfare vessel bearing the prime minister of Canada on his annual visit to the Arctic. Also present were the CCGS *des Groseilliers* (a major Canadian Coast Guard icebreaker), the three-masted schooner research vessel *Sedna IV*, and the annual sea-lift cargo ship *Anna Desgagnés*.

Latitude's owner was surprised to see so many ships in one place in the Arctic, having always imagined that the whole region was an uninhabited wilderness.

As soon as all ship's business had been attended to in Pond Inlet and anxious to get away from all the small boats of heavily armed naval crew-men buzzing about the anchorage, *Latitude* weighed anchor and headed for the remote peacefulness of Milne Inlet in the hope of sighting narwhal, which duly appeared on cue. That we were in sight of the construction work at the Baffin Island Mary River Mine cargo-handling facility at the end of Milne Inlet did not seem to matter.

We had our only narwhal sighting.

The ice maps of Victoria Strait and Peel Sound were not looking good, thus we knew we had time to kill before making the dash for Cambridge Bay (Ikaluktutiaq), so it was decided to spend some time sightseeing on the southern coast of Devon Island. The weather co-operated as there began a whole week of gorgeous bright sunshine, mild temperatures and flat calm while exploring westwards from Dundas Harbour to Beechey Island.

The route from Milne Inlet to Dundas Harbour took *Latitude* through Navy Board Inlet, where we came across four huge tabular icebergs—presumably fragments of an even bigger berg—which must have come south from the polar ice shelf—though the guests speculated that they had come from Antarctica, which is famous for large tabular bergs. An impromptu lecture on world ice distribution was immediately delivered to set the record straight.

The cruise along the Devon Island coast was very productive, visiting Dundas Harbour, the glaciers of Croker and Blantley bays, and also Radstock Bay, with overnight anchorages at some stops, and sightings of ringed seals, harp seals, several more polar bears, walrus, bowhead whales—and four sperm whales swimming slowly westwards. These stopped for almost an hour to play with our tender at the end of its towline. Beechey Island was the last stop of this exploration, by which time one of the guests realised that he was not going to catch his flight home to Malaysia from San Francisco if he waited until *Latitude* reached Cambridge Bay at a date so far undetermined; so he decided to leave the vessel at Resolute Bay, which was not in the original plan.

Prior to leaving Beechey Island there had been no drift ice at all, but the crossing to Resolute Bay was rapidly filling up with heavy drift ice coming south out of Wellington Channel, so that the 55-mile crossing took over 12 hours of threading a way through 3-5/10ths concentration of thick first-year ice with some massive second-year floes embedded. Our guest caught his flight out from Resolute, and the next day *Latitude* embarked on the serious business of heading for Cambridge Bay, even though the ice maps were still not very encouraging for transit of Victoria Strait. With the northern entrance to Peel Sound still blocked by ice, Bellot Strait was going to be the only possible route to the west.

The drift ice in the western end of Lan-

caster Sound spread rapidly to the south and east, spilling into Prince Regent Inlet, so that *Latitude* was negotiating 2-5/10ths concentration of thick first-year ice, with strips of 8/10ths all the way from Resolute to Fort Ross at the eastern end of Bellot Strait for the next three days, stopping to release the tender when towing became impossible and then re-connecting the tow whenever the ice would permit. On arrival at Fort Ross, *Latitude* went to anchor in Depot Bay as ice was reported in Bellot Strait by the CCGS *Pierre*

Radisson, which was escorting a ship west-bound just as *Latitude* arrived in the offing. *Latitude*'s request for inclusion in the convoy was denied. Each change of tide thereafter, the tender was sent into Bellot Strait on an ice reconnaissance mission, reporting back every time that there was too much ice for *Latitude* to handle. *Latitude* remained at anchor at Fort Ross for two more days. On the evening tide of the second day at anchor, the tender reported that she had made it all the way through Bellot Strait to Peel Sound, so it was decided to make an attempt to get *Latitude* through on the morning tide of the next day.

In due course, the anchor was weighed, just before morning slack water, and *Latitude* headed into the main channel of Bellot Strait, to find that there was still a considerable amount of ice coming through east-bound on the slackening tide, but there was enough room between the floes to be able to make progress. The tender was following close astern under her own power and the Narrows at Magpie Rock were soon astern, so that the whole width of the channel was now available for manoeuvre—and most of that width was used as *Latitude* worked her way from side to side to take advantage of the current, which was transporting the ice from one side to the other.

It was here that we observed the last two of the 19 polar bears sighted during the voyage, but we were in no position to stop to take any more photos (between them, the guests reckoned they had about 20,000 images of bears alone); even though the tide was changing in our favour, we needed to break out to the loose ice of Peel Sound.

With just one mile left to clear the strait at the western end, we came to a giant floe of well-rotted and puddled, thick first-year ice wedged across the channel and grounded on both shores. By putting the bulbous bow of *Latitude* to the middle of the eastern floe-

edge and gradually increasing the RPMs to full power, the single floe began to disintegrate into many smaller floes which loosened up and drifted by on the tide as the two extremities came off the banks of the strait. *Latitude* was finally through to

the 2/10ths ice concentration of Peel Sound and, within the hour, heading south in open water. The owner was amazed that his little ship with no ice-class could break an ice-floe that large, but then he had not recognised that this was a floe in the last stages of melt and actually posed no threat to a steel vessel, provided there was no sudden impact.

The next problem was going to be the ice in Victoria Strait, where the CCGS *Pierre Radisson* was escorting every ship, large or small, though 7-8/10ths concentration of thick first-year ice with old ice embedded, along with some areas of 9/10ths, for a total distance of about 60

miles. This kind of ice was far more than *Latitude* could handle, even under escort, especially with a boat in tow.

The fog rolled in during the night, so *Latitude* drifted in the open water of Larsen Sound for the hours of darkness, setting off in the fog the following morning to follow the ice edge southwards towards James Ross Strait. By mid-morning we came across the CCGS *Pierre Radisson* drifting in the loose ice awaiting a southbound vessel to escort through Victoria Strait. It was arranged that she would escort *Latitude* through the remaining loose ice to the nearby northern entrance of James Ross Strait. No sooner had the escort been taken up than visibility improved, and we found that the ice was almost completely dispersed; so, after about half an hour, the escort was terminated, and *Latitude* proceeded independently to the open waters to the east of King William Island. That was the last ice encountered during the voyage. The St. Roch Basin, Simpson Strait, and Storö and Requisite channels were open water, and the rest of the voyage from western Queen Maud Gulf to Nome was ice-free.

Cambridge Bay was finally reached on 10 September, at least two weeks later than intended. This was an essential stop, to re-fuel for the last part of the journey to Nome. The sealift tanker with the annual delivery of fuel for the village had also been delayed by the ice, and the village had completely run out of diesel-fuel. *Latitude* was obliged

Cambridge Bay was ... an essential stop, to re-fuel for the last part of the journey to Nome. The sealift tanker with the annual delivery of fuel for the village had also been delayed by the ice, and the village had completely run out of diesel-fuel. *Latitude* was obliged to wait until the tanker showed up.



Walrus on ice-floe, Croker Bay, Devon Island.



Scott Inlet, Baffin Island, Nunavut.

to wait until the tanker showed up two days later and had pumped enough fuel ashore for *Latitude* to go alongside the pier to load the pre-arranged 30,000 litres of diesel fuel from tanker-trucks.

It was the evening of 13 September before the voyage could continue, so the decision was made to travel non-stop from Cambridge Bay to Nome. The planned diversions to look at the Smoking Hills and visit Herschel Island or Holman were no longer

considered. There was a shipyard waiting at Seattle to take the vessel and still a long way to go after reaching Nome for another re-fuelling stop. The weather-window after leaving Cambridge Bay was good. In fact, a following easterly gale developed off Tuktoyaktuk, helping to keep up the 10-knot speed; a headwind would have knocked it back to six or seven knots. The polar-pack ice was reported to be more than 100 miles north of Point Barrow, but the course was

set to pass very close to the point itself to avoid a heavy beam sea as *Latitude* turned to the southwest at last upon entering the Chukchi Sea.

And so, a week after clearing Cambridge Bay, Nunavut, on the fine, glassy calm evening of 20 September, *Latitude* slipped between the breakwaters of Nome, Alaska, to moor at the inner berth on the west breakwater for the night, before shifting to the brand-new fuelling dock in the inner harbour on the following morning. The Northwest Passage had been completed—not conquered—at last, 37 days out from Ilulissat on what had been expected to be a 24-day transit. Such is typical Arctic navigation, never to be taken for granted. ¶

Born and educated in the UK, Patrick Toomey went to sea in 1949 to serve as navigating officer for 16 years in the British Merchant Navy. He sailed world-wide in cargo ships. He obtained his Master Mariner (Foreign-Going) certificate in 1960 in London, England. Emigrating to Canada 1964, he joined the Canadian Coast Guard as a navigating officer. He commanded nine different Canadian Coast Guard icebreakers from 1970 to 1991. On retirement from Canadian Coast Guard in 1991, he set up a consultancy as specialist in ice navigation. He has since sailed as ice-pilot on polar expedition cruises with six Russian icebreakers, various passenger ships and private mega-yachts in Arctic and Antarctic waters. Consultancy activities include work as an expert witness during litigation concerning ice navigation; training of ice navigators; nautical journalism; design of icebreakers and polar vessels; public lectures concerning polar regions; developing government and international regulations concerning ice navigation; book reviews; co-authoring of The Ice Navigation Manual; and membership as a Fellow of the Royal Canadian Geographical Society (FRCGS).

The International Sea Ice Reporting Code Demystified for the Landlubber

Anyone who has ever sailed in ice-covered waters will be familiar with the International Sea Ice Reporting Code. It is numerical and can be understood in any language. Here is a very brief description of how it works.

First, the composition of sea or lake ice is classified under the code in two major categories: "Old Ice" (more than two years old) and "First Year Ice" (ice formed in the previous winter, which has not survived a melt-season).

Each of these categories is subdivided further, for a total of 17 types of ice in three groups, namely, (i) Ice of Land Origin (which is all glacial ice); (ii) Old Ice (two groups); and (iii) First Year Ice (three groups, sub-divided into 14 sub-groups). Each of the 17 types of ice is fully defined with thickness, density and description, and given a Code Numeral. (Most people would never imagine that ice recognition is so complicated.)

Second, once the ice so-categorised in the first step is recorded, the next step is to define individual floe-size. This can range from "tiny" floes (unofficially defined as being smaller than a grand piano) known as brash or rubble, right up to giant floes of greater than 10 kilometres diameter. Each unit of the seven-step range of floe sizes is given a Code Numeral.

Third, the concentration of ice in the ice-field is coded simply by the number of "10ths." These are not actually frac-

tions, but, rather, percentages.

Knowing the composition of the ice field is useful, but it is concentration of ice that really interests the ice navigator. The concentration code indicates right away if transit for a given vessel is possible.

An ice-field concentration is estimated, or measured, in "10ths" of ice coverage. Therefore, "1/10th" means 10 percent of the sea-surface is covered in ice, and 90 percent is open water between the floes. Most ships will not be able to make much rapid progress in concentrations of more than 6/10ths (60 percent ice and 40 percent space between the floes on average over a given area), and in 10/10ths concentration (100 percent ice-coverage), only icebreakers can move if the ice is Thick First Year by definition (greater than 120 cms thick). Ice-strengthened vessels can make good progress in New Ice (less than 10 cms thickness by Code definition). However, in Young Ice (only two categories higher by definition in the Code at up to 30 cms thickness) the same ship could probably make no progress at all.

Of course, the ice navigator is thinking not only of progress to be made through ice, but the potential for damage to the vessel caused by ice. Thus, in a fairly open and varying concentrations of 3/10ths to 5/10ths (written as 3-5/10ths)



Ilulissat, Greenland. Glacial output from the Jakobshavn Isfjord to 14 miles offshore.

which contains mixed floes of new ice and old ice (second-year floes, for instance), the danger of ice damage is greatly increased, as Old Ice is deadly—even to icebreakers—if collided with at significant speed. Mega-yachts such as the motor yacht *Latitude* dare not even touch Old Ice at any speed, so finding a route through this type of ice-field is a very precarious process, requiring the constant identification of potentially dangerous floes to be avoided, and progress being made at a very slow speed in case of accidental contact. ¶
Capt. Patrick R. M. Toomey, Canadian Coast Guard (ret.), has over 50 years experience as an ice pilot—but says he is "still learning!"



This cow moose put the sneak on Chris Kiana, Sr., coming up behind him from a gully. They checked each other out while he snapped this photo.

Simple Hunting Trips in Alaska

by Chris Kiana Sr., BBA, MBA, MA-RD, DBA-ABD

I think the best way to start an account of moose hunting is to offer some comments and photos of hunting trips I've been on over the past decades. If memory serves, I have harvested about 20 bull moose in my years of hunting, with the best years between 1994 and 2007. In that period, I harvested nine to 10 moose from what has become my favorite site in the interior of Alaska. In those early days I hunted with one or two experienced hunters and friends.

Finding compatible hunting companions is not easy. Friendship is just one element in the equation and ranks several notches down a list that is topped by experience in the wild, respect for the animals and the environment that supports them, and finally the patience to endure the hardships and unexpected problems that almost al-

ways arise. After a hard day of moose hunting, then comes friendship and the stories to be told around the campfire while you swirl an inch or two of bourbon in the bottom of your tin coffee cup.

What, for many years, was our favorite hunting area is located in a rugged and mountainous area approximately five miles wide and some 30 miles long. It is a difficult trip just getting there, and we use four- and six-wheeled all-terrain vehicles. It takes a lot of gear to support two or three hunters in the mountains for a week or so—not just the calculated consumables of fuel and foodstuff, but also tents, sleeping bags, rain gear, guns and ammo, camping tools, tarps, and, of course, coolers and plastic containers and bags to pack the expected bounty of the hunt. On top of all this is a quantity of spares and excess of the aforementioned,

just in case the worst case happens: personal injury, vehicle breakdown, horrendous weather event or who knows what? There is nothing like a hunting trip in a remote area more certain to confirm the adage, "If things can go wrong, they will!"

In recent years my former hunting buddies have gone their separate ways and, rather than trying to find new companions—finding the right combination of the "right guys" can take three to five years of experiencing each other's company—I have taken to going solo. (Once in a while, a hunter will join me for a few days, like my son or a friend.) Yes, there is real risk being out alone, and I don't lay claim to being an expert outdoorsman but—knock on wood—in all my years I have not had an accident, nor experienced a dangerous situation that I could not handle.

After traveling 10 miles from camp over rough trail in his ATV, Chris Kiana Sr. overlooks the headwaters of the Nenana River up in the Interior, awaiting moose.



Courtesy of Chris Kiana Sr.

BUSY BUT COMFORTABLE CAMPSITE—Two all-terrain vehicles, a campfire and, at the upper right, a white motorhome.



Courtesy of Chris Kiana Sr.

Caribou amidst Alaska's autumn foliage.



Courtesy of Chris Kiana Sr.

Chris Kiana, Sr., crosses the creek in his ATV to demonstrate proper technique to his companions. They followed his example and had no problems.



Courtesy of Chris Kiana Sr.

Again, harking to recent years—2008 and 2014—I have returned home without having harvested a moose; but, far from feeling disappointed with the venture, I have savored the solitude of a lone camp and all that takes place.

I have a spot where I have parked my motor home for the past five years. Once I get set up, my first thoughts turn to fire wood for burning in the evening. The campground spot has a pre-cut piece of iron pipe on the ground, where I can control-burn my wood. As it begins to get dark outside, I start a campfire, then sit in a camp chair, listening to the near-by crystal-clear stream, with hopes that clouds will not block out the stars. With the fire burning warmly, I look overhead, searching for friendly stars such as the Bear, Dipper, North Star, Venus and others. I am not a “studier of the stars,” but take great comfort in seeing them glow overhead. What I find fascinating is that it takes so many light years for the glow from them to be seen by me, here, so far away.

Next, I look for the satellites passing overhead and take great interest in the various directions they are headed. I remember seeing the Russians’ Sputnik pass overhead in the late 1950s. I can’t remember if it had a monkey or dog as a passenger (my thoughts are leaning toward a dog?).

The next thing I look for is the hint of northern lights. My camping trips happen at different times of the year, and sometimes it is too early in the season. But at other times, one can see the suggestion of lights in the heavens. I can actually remember having seen the northern lights dancing through the entirety of the heavens —north-south-east-west—all at the same time. I can’t remember what this phenomenon is called, but it is said to happen only once every 25 years.

With the otherwise dark night all around me, the burning firewood glows, and once in a while the wood will pop—a very cozy “camp-like” sound that fits right in with the mysterious night.

I like to get away from city life a couple of weeks at a time, to wash my insides (so to speak) free of the urban way of life and just enjoy the outdoors.

Still, I do appreciate the little bit of civilization I’ve brought with me as I disappear into my motorhome and retire for the night. Sometimes in this area, it rains at night for an hour or two, so my warm sleeping bag is a pleasant place to be. This is the time to really enjoy sleeping, listening to the rainfall. Snore!

When I get up in the morning, I generally cook a hearty breakfast. First on the list is making coffee. I enjoy listening to the coffee perk and smelling its wonderful aroma as it brews. I then throw on the bacon. Ummmm to my taste buds! I peel the spuds, and into the frying pan everything goes. As it all cooks, I sip my coffee and collect my thoughts for the day. After breakfast, I put extra coffee in a thermos, make some extra sandwiches for the day, and my now-full belly is out the door!

I have towed my four-wheeler with me and have a dump bed on the back of it to carry all of my needs for being out in the country. Not only do I carry my hunting gear and the food I have prepared, but I also carry tools,

Welcome, Chris Kiana!

We are happy to introduce Chris Kiana, Sr., our new correspondent from northern latitudes. If I had to describe him in two words or less, I would instantly say “Renaissance Man.”

Chris is an Inupiaq Eskimo, born and raised in Alaska. He is a Vietnam vet (USN), author of five books (see *Alaska Crying Baby* under “Book Reviews,” page 33), holds a BA in Business, an MBA, an MA-Rural Development, and is working the final stage of a Doctorate of Business Administration (DBA).

Far from the constant scholar, Chris has done it all: 25 years in construction around the U.S., including the

Alaska Pipeline, and equal number of years in business development projects, including extensive work with tribal development organizations and state and city organizations. Withal, Chris has stayed close to his roots and, among other things, has lived the outdoor life as much as time and duty have allowed.

We’re hoping Chris will become a regular correspondent with *The Polar Times*, providing us “on the ground” commentary about the Alaskan scene. He starts with this article, “Simple Hunting Trips in Alaska,” telling us of his experience harvesting the “big guys” and the rewards of camping in the wild. Enjoy! — **Editor**

How Kiana, Alaska, Got Its Name

as told by Chris Kiana, Sr.

Kiana, Alaska, is located in northwest Alaska on the Kobuk River.

This place is actually my namesake. I am 1/16th Hawaiian, or “kaiana.”

Story has it, a great Kaiana chief was dying in the 1840s in Hawaii. His two sons both wanted to be chief; they split up the five Hawaiian Islands tribes and went to war against each other. When it was evident that one son was going to lose the war, he jumped aboard a passing ship and ended up in Northwest Alaska.

In about 1860, when it became evident to the Hawaiian prince that local Eskimos were scheming to kill him, he

sent his Eskimo wives and kids far away. The Eskimos succeeded in killing him at the site where Kiana Village is now located.

When the mapmakers went to northwest Alaska at the turn of the last century, they asked, “What is this place called?”

The local Eskimos told them, “This is where kaiana [now spelled and pronounced Kiana] is buried.”

The people who live in Kiana now—mostly Eskimos—believe the name of the village means “where there are two rivers meeting.” ¶

plus whatever I might need, should I have to stay out overnight, which could be the case if I harvest a moose late in the day. I carry a sleeping bag and a tent plus GI “C-rations.”

In the location where I camp, I can go in several directions to hunt moose by road and all-terrain vehicle (ATV) trails.

I don’t mind hunting alone. At 70, I certainly know how. I have harvested moose

by myself, from shooting one, gutting and quartering it, and loading it all on the dump bed of my Polaris side-by-side four-wheeler.

But whether hunting or just camping, I really enjoy just being out in the country. I hope this description of one of my typical trips into the wilderness has given you some idea of what it is like to leave the city behind and follow the call of the wild. ¶

IMO Adopts Landmark Polar Code

gCaptain.com, 22 November 2014, by Mike Schuler—During the 94th session of IMO’s Maritime Safety Committee held this week, the IMO adopted the International Code for Ships Operating in Polar Waters, commonly referred to as the Polar Code, as well as related amendments to the International Convention for the Safety of Life at Sea (SOLAS).

The Polar Code is the first mandatory blanket legislation for ships that specifically addresses potential hazards unique to arctic and antarctic environments, such as ice, remoteness and rapidly changing and severe weather conditions, and provides goals and functional requirements related to ship design, construction, equipment, operations, training, and search and rescue.

The expected date of entry into force of the SOLAS amendments is 1 January 2017 for new ships constructed after that date. Ships constructed before 1 January 2017 will be required to meet the relevant requirements of the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 1 January 2018.

The Polar Code will be mandatory under both SOLAS and the International Convention for the Prevention of Pollution from Ships (MARPOL).

The adoption of the Polar Codes comes as maritime traffic increases in the polar regions, particularly in the arctic where shrinking sea ice has opened new routes and extended the summer shipping season.

Ships trading in the polar regions already have to comply with all relevant international standards adopted by IMO, but the newly adopted SOLAS chapter XIV (“Safety measures for ships operating in polar waters”) adds additional requirements, by making mandatory the Polar Code (Preamble, Introduction and Part I-A (Safety measures)).

While the Code is largely welcomed and viewed as a major step forward for shipping in the arctic, it has been criticized over aspects that it does not address, such as ballast water treatment and the use of heavy fuel oil. ¶

Glacial Balance

by Lonnie G. Thompson, Distinguished University Professor, School of Earth Sciences
Senior Research Scientist, Byrd Polar and Climate Research Center

Mountain glaciers provide the theme of a film produced in 2013 by documenting retreat of selected glaciers in six countries in the Andes Mountains, with commentary and interviews by a scientist-investigator and world-renowned glaciologist Dr. Lonnie Thompson, Distinguished Professor at The Ohio State University. The purpose of the film *Glacial Balance* is to emphasize the impact of climate change on glaciers and how that affects people and ecosystems from the summits of mountains to the bottoms of valleys. Excerpts from the 23 minutes of Lonnie's interview follow, in which he discusses some highlights of glaciology and ice-coring for studies of paleoclimate, and predictions of the demise of specific glaciers from his 55 expeditions to 16 countries over a period of 35 years. A review of the film can be found on page 32 in this issue.

I came to The Ohio State University as a graduate student in 1971 to study coal geology; however, I soon transitioned to the study of climate from ice core records. I was very fortunate as a student to have the opportunity to work with Dr. John Mercer, a research scientist in what was then the Institute of Polar Studies (now the Byrd Polar and Climate Research Center) who had created an atlas of the glaciers of the world.

John and I discussed two very important things that changed the course of my life: a collection of aerial photos of a large ice cap in the Andes of Peru, named Quelccaya, that was part of his collection from his earlier work at the American Geographical Society, and an idea that already-existing climate records from Antarctica with Greenland ice cores could be connected with a similar record from the tropics.

When we approached Dr. Jay Zwally (then the program director for NSF's Polar Program's Glaciological program) about a drilling project on Quelccaya, he said that he was in favor but unfortunately could only fund ice core research north of the Arctic Circle or south of the Antarctic Circle. So, in the winter of 1973, I joined my first expedition

to Byrd Station in West Antarctica.

In February 1974, I received a telegraph from Jay stating that he had funded all his "real" science projects and had \$7000 left over for Quelccaya if we still wanted to go there. We accepted the funds and that summer traveled to the 18,600-foot summit of Quelccaya. We made our first field studies and collected our first few samples, but it was enough to be able to demonstrate the presence of a remarkable annual record preserved in this tropical ice cap.

Quelccaya proved to be my training ground, but also destroyed my naivete about the nature of high-altitude field work. I thought drilling at 18,600 feet would be easy, so, in 1978, we contracted with the Peruvian Air Force to use a Bell 212 Twin Engine helicopter to fly a large drill and generator, previously used in Antarctica, to the summit and carry the ice cores back down. In 1979, we arrived back in Peru to begin the first deep drilling project on a high-altitude tropical glacier. However, we soon learned that the air at ~19,000 feet above sea level was too thin to support such a large helicopter, even without trying to carry heavy drilling equipment. The weight of the equipment also made transport overland by horse impossi-

ble (a two-day journey by horse at that time). For a while, this failure forced me to reassess my career options, but it also forced us to get innovative by designing and constructing a lightweight drill and a solar power source.

While performing surface studies on Quelccaya in 1981 and 1982, we tested so-



Lonnie Thompson at Qori Kalis Glacier, Peruvian Andes, August 2000—His research team has been measuring the melting of this glacier over the last 20 years. Elevation of the Quelccaya ice cap is 18,700 feet.



Winter 1973—Lonnie Thompson on his first expedition to Byrd Station in West Antarctica.

lar panels and found that they produced 20 to 30 percent of power above manufacture specs because half of the Earth's atmosphere was below us. However, we had to submit another proposal to NSF to drill the ice cap using solar power, which was difficult given both our past failure and our proposed use of untested technology. One of the reviewers, Willi Dansgaard, sent a very short review to NSF (and sent a copy to me) in which he stated that Quelccaya was too high for people to safely live and work and that the technology to drill it did not exist. However, the new program manager in the NSF Office of Climate Dynamics, Hassan Virji, was willing to take a chance on us.

In the summer of 1983 our team spent three months on Quelccaya, using the first photovoltaic-powered ice core drill to successfully recover two cores to bedrock.

At that time we did not have the means to keep the ice frozen, so we sectioned, melted, and bottled 6,000 samples between the two cores and shipped them to OSU. We sent one of the cores to Willi Dansgaard's lab for oxygen isotope analysis, and he subsequently became one of our most enthusiastic supporters. This opened the door to further high-altitude ice core work and eventually to the Office of Polar Programs defining the polar regions as encompassing the glaciers that covered the high mountain regions of the world. While I was developing high-altitude tropical glaciology, Ellen



Solar array and light-weight drill on the summit of the Quelccaya ice cap in 1983.

Mosley-Thompson concentrated on the records from the polar ice sheets—Antarctica and Greenland. Since the mountain field seasons were out of phase with the polar field seasons, it ensured that one parent was always home while our daughter Regina was at home.

For the last 36 years, our research team at the BPCRC, along with international colleagues, have conducted ice core drilling expeditions in 16 countries throughout the Himalayas and Andes, on Kilimanjaro, and in New Guinea and both Polar Regions (including Greenland, Antarctica and the Russian Arctic) in order to document and understand Earth's rapidly changing climate. During these expeditions we have endured harsh conditions, living for months in very remote locations far from basic comforts we take for granted such as warmth, cleanliness, easily accessible food and communication home. In addition to that 1983 Quelccaya expedition, we have accomplished many "firsts" in ice-core research: first cores drilled in Tibet (Dunde, 1984-87), first tropical ice-

core climate record that extends back to the last ice age (Huascarán, 1993), which helped develop new insights into sensitivity of the tropics to climate change, and the drilling of the oldest ice found outside the polar regions (Guliya ice cap in western Kunlun mountains, 1992). We have documented the loss of glaciers around the world and determined the extent of ice loss through the Holocene by collecting and dating recently exposed plants near glacier margins. Ice cores from many vanishing tropical glaciers are archived in the freezers at BPCRC, and these cores will likely still be here after those glaciers completely disappear.

We have worked in the Tibetan Plateau Region (aka the "Third Pole") for 30 years. I am foreign member of the Chinese Academy of Sciences and serve as deputy director of the academic advisory committee in the Institute of the Tibetan Plateau Research, which I helped establish in 2003, with campuses in Beijing and Lhasa. In 2009, Professors Yao Tandong and Volker Mosbrugger and I founded the Third Pole Environmental program (TPE), which is a coordinated multi-disciplinary scientific effort among 14 countries to address major environmental questions such as the status of glaciers on the Third Pole. The TPE program includes a strong educational compo-

nent and an integrated study of paleo-records to develop the context essential to assess and address the impact of anthropogenic activities.

I believe that future climate research will be driven by questions that the ice core proxy climate histories can answer, such as: (1) the evidence for rapid climate events of the past, both local and global, and their causes; (2) differences between the pre-Colonial fire history of the Amazon Basin and the modern frequency and extent; (3) the integration of ice core records with those from other proxies such as tree rings, corals, lake and marine cores in order to understand large-scale processes and to develop scenarios that can be presented to policy-makers; (4) the extent to which melting ice sheets and glaciers will contribute to sea level rise; (5) how large scale systems such as El Niño and the monsoons will change in a warmer world and how those changes might affect precipitation patterns and seasonal variations.

Finding solutions will require the sustained international efforts of numerous talented people from many areas of specialization. ¶



LONNIE THOMPSON AND PRESIDENT GEORGE W. BUSH—Thompson receives the National Medal of Science



PHOTOS OF ACTIVELY DISAPPEARING HIGH-ALTITUDE TROPICAL GLACIERS—Top, on top of Kilimanjaro, Tanzania (taken in 2000). Bottom, glaciers near Puncak Jaya, Papua, Indonesia (taken in 2010)

Paths to Polar Careers

In our last three issues of *The Polar Times* we presented a series of articles describing the avenues for entering and pursuing professional careers in the geographic regions north and south of latitudes sixty. These paths all emanated from programs resident in Academia and we featured some of the Universities who are long time players in the field of polar studies and some that we dubbed, "new kids on the block".

Coldly calculating the inevitable end to this series we deliberately left aside the, "what on earth am I doing here and why in the world am I staying," category, reckoning that when this was offered

it would resonate with a whole bunch of our readers and serve as a perfect wrap.

In this category we find those who answered an ad on a whim and swoosh, found themselves on an airplane north or south bound. Others served in the military and got infected by an ice bug and couldn't stay away and can't leave. And other reasons, random, deliberate or, somewhere in between though not infinite in number are far too many to recount. So, in closing the series we reached into the hat and drew the following three vignettes, "in their own words." ¶

The National Science Foundation manages the US Antarctic Program, hiring contractors to provide everything from logistics to helicopter support. A prime contractor is selected to move cargo and personnel, feed everyone, provide and maintain heavy equipment, run the power plants and ensure everyone stays warm and safe during their expedition. Everyone needed to run a small town and oversee science at field camps and on two icebreaking ships are hired by the prime contractor.

Lockheed Martin took over as prime contractor in 2012, with several subcontractors working under an umbrella called Antarctic Support Contract, ASC. The people highlighted in this section are all current employees of ASC but began their polar careers under previous contractors.

to be there, "you might just as well apply for some jobs to kill the time."

So I went to the job fair, just to accompany him and with no intention of really wanting to go to Antarctica.

He and I applied for numerous jobs that day, and a few weeks later we learned that I had been hired, but he had not! By then I had decided that it might actually be a

"Office of Miscellaneous." It involves public affairs, working with the media, communicating within ASC and outside, education outreach, knowledge continuity, responding to hundreds of public requests for post cards/prayers/answers to questions from around the world. I edit a handbook called *The US Antarctic Participant Guide*, manage the Antarctic Photo Library and try to learn as much as I can about the history of the USAP. I also help guide artists and writers, as well as teachers, through the preparation and physical qualification process. Most of my job is done in our Centennial, Colorado, office, but the highlight is to deploy to one of the three stations each season to establish a connection with the nearly 1,000-person labor force the ASC employs annually.

The main reason I love the USAP is because of the type of people who are drawn to work in Antarctica. I am surrounded by some of the most brilliant, talented, funny, hard-working people I have ever met. As we often say, where else can you have breakfast with an astrophysicist, lunch with a penguin expert and dinner with a paleontologist, followed by an evening visiting with your co-worker who just returned from climbing Mt. Everest ... bicycling through Turkey ... working in an elephant reserve ... or a stint with Doctors Without Borders? The dining room attendant may have a master's degree in linguistics, and the shuttle driver may be retired from a career with the NYC Ballet. I cannot imagine where else one could find such a myriad group of people working long, hard hours to support science.

And the science is simply amazing. McMurdo is exciting as we prepare the ice core drillers to move to deep field camps to study climate change. South Pole's astrophysicists are studying the evolution of the universe, which is mind-bending to comprehend. And Palmer Station's biology, with every

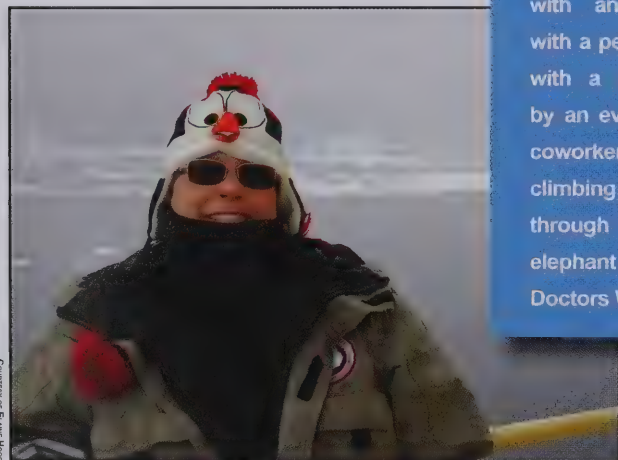
Where else can you have breakfast with an astrophysicist, lunch with a penguin expert and dinner with a paleontologist, followed by an evening visiting with your coworker who just returned from climbing Mt. Everest ... bicycling through Turkey ... working in an elephant reserve ... or a stint with Doctors Without Borders?

rather interesting adventure to go to Antarctica, so I accepted the job as courier and mailroom person for McMurdo Station.

I had been living and working overseas in various countries during my nearly 20-year teaching career, so Antarctica was one more place I thought would be a grand adventure. I thought I was leaving my teaching position for one year and would return with great new stories to tell my students.

But then I got sucked into the US Antarctic Program vortex of amazing people and incredible science, and here I am almost 20 years later, still in love with "the program," as we call it.

My position since 2000 has been entitled "Communications," but I jokingly call it the



Antarctic Support Contract Communications Specialist Elaine Hood on board the research vessel *Laurence M. Gould* as it sails through the Neumayer Channel en route to Palmer Station.

Elaine Hood

"Just go. Go to Antarctica," is what I kept telling my husband. He had been saying for years that he wanted to go work there.

"Don't you want to come with me?"

"Heck no. I hate the snow and cold. Just go and get it out of your system."

He convinced me to ride along with him to the job fair the primary contractor to the US Antarctic Program (USAP) was holding in Denver that next week.

My husband said as long as I was going

member of the Antarctic wildlife community on our doorstep, is just plain fun. When you live and work alongside the scientists, you gain an insight that no one else on Earth probably has.

So, here I am, firmly committed to my career in the polar regions, even though I still am not crazy about snow and cold.

And by the way, yes, my husband DID end up working in Antarctica as well! ♫



Marine Projects Coordinator Al Hickey stands in front of the research vessel Laurence M. Gould at Palmer Station.

Al Hickey

It was seeing two photos on two different occasions, years apart, that drew me into working for the US Antarctic Program as a marine projects coordinator. The first photo was of a friend's sister standing in front of the South Pole geodesic dome where she worked as a cook. I remember thinking, "That is so cool! I want to go there."

The second photo was on a colleague's office wall at the Sea Education Association (SEA) in Woods Hole, MA. I went into my friend's office and there was a panoramic picture of the US Antarctic Program's research vessel RVIB *Nathaniel B. Palmer* (NBP) surrounded by ice. It was such a striking photo, I thought, "Wow! What is that all about?"

My friend had worked a little on the NBP. I began to ask him all sorts of questions and decided right then that I wanted to do this. The thought of going to Antarctica had been brewing for many years. The calling of those photos—the aesthetics and the stark, clean beauty of the environment combined with my prior years of working aboard research and educational vessels—finally did it for me.

I began applying for jobs with the US Antarctic Program in 1993. It took two years before an opening and my availability synched up, so that I could head south.

My first trip was in March 1995, as the Marine Projects Coordinator (MPC) on

I had a room with two large port-holes and woke up at 3:00 a.m., hearing a horrible scraping along the hull. I thought maybe we had hit a rock and were running aground. I went to those port-holes, looked out and discovered a most stunning scene!

the R/V *Polar Duke*, for a science fishing cruise. Over the past 20 years I've held different positions on three research vessels, the *Polar Duke*, the NBP and the ARSV *Laurence M. Gould* (LMG). I have worked in

the Denver office of the prime contractor as Marine Superintendent, and as a fuelie and working the cargo line at South Pole. I presently work for Lockheed Martin's Antarctic Support Contract (ASC).

The MPC is the head of logistics and operations aboard the ship, functioning as an interface between the ship's crew, the science party, and the support staff that is employed by ASC. My number one mission is to facilitate science. I coordinate everything the scientists want to accomplish with the support staff and the ship's crew. On the boat, I wear many hats, including logistics person and travel assistant. I coordinate operations (ranging from the purchase of

supplies in port to organizing medevacs), order fuel, act as a listener, liaison between numerous entities both in the USA and internationally for port calls, and address numerous other details. I meet daily with the captain, chief scientist and support staff to discuss and plan each day. If there are any issues we correct them. I coordinate with our agents in Punta Arenas, Chile; Lyttel-

ton, New Zealand; Hobart, Tasmania; or wherever we find ourselves, to ensure proper cargo loading, along with a myriad array of vessel and crew needs. I keep the folks at ASC and in numerous other locales up to speed on what is happening. The MPC's job is similar to being a station manager in Antarctica (and also similar to the field work I do with Doctors Without Borders when I am able to schedule that during long periods of open time off the ships).

My first memory of Antarctica was on that first *Polar Duke* deployment in 1995. I had a room with two large port-holes and woke up at 3:00 a.m., hearing a horrible scraping along the hull. I thought maybe we had hit a rock and were running aground. I went to those port-holes, looked out and discovered a most stunning scene! You could only see two contrasting colors, vivid navy blue and brilliant white. There was a full white moon shining on the stark white snow-covered mountains of Brabant and Anvers islands in Dallmann Bay, and we were going through alternating patches of brash ice and cold blue water. It was the most amazing sight! I will never forget it. It is hard to capture in words the awe and wonder associated with that first visit, and the uniqueness and the many "firsts" on every subsequent cruise.

There are so many memories I have of the almost 100 trips I've made to Antarctica. I remember the very first time I visited a penguin rookery. There was time to kick back and relax for an hour in this rookery. I was in a trance just watching them goof-ball around, slip-sliding, interacting with each other. I had never seen anything like it before. The "Happy Feet" movies capture

much of what visitors witness when they visit a penguin gathering. So much of the Antarctic experience is totally unlike anywhere else on Earth. It was all so new to me; the weather patterns, wildlife, the colors, and the

ice. It was awesome and exciting in every way imaginable!

I was the MPC on the NBP during the rescue medevac of crew off a Korean fishing vessel in the Ross Sea in January 2012. We got the phone call at 3:30 a.m. and immediately pulled all gear out of the water to begin steaming to their location. It

I think that most employees of this program would agree that the friendships you make in this remote spot are one of the great rewards of working in this special place. — Ken Navarro

(CONTINUED ON PAGE 26)

CREVASSE!

A major crevasse-fall accident, recorded here by Robert Dodson of the Ronne Antarctic Research Expedition, 67 years after the event, has been referred to in at least six books. (See Endnote 1) None of them tell the whole story. The following is intended to set the record straight. Ronne's expedition, 1947-48, had its base on Stonington Island on the west side of the Antarctic Peninsula.

It was July 26, 1947, a midwinter day in Antarctica at a mile-high altitude in the mountains on the edge of the continental plateau on the Antarctic Peninsula. At the foot of the mountains, on the shore of an ice-covered inlet of the Southern Ocean called Marguerite Bay, was an exploration base known as Stonington Island. It was the home of a 23-person American group, the Ronne Antarctic Expedition. Its occupants and those of a nearby British 11-man base of the Falkland Islands Dependencies Survey (FIDS) were, at the time, the most southerly people in the world.

High above the base, just where the continental plateau started its break downhill in a steep glacier that went all the way to an ice ramp that led to Stonington Island, two of us from the American group—myself and Pete Peterson, the expedition's physicist—had been camped in a tent for a week enduring the worst blizzard we had ever encountered.

The purpose of this mid-winter trip was to establish two men in a tent on the mile-high plateau for a week or more to carry out meteorological observations and to lay the base for a permanent weather station. A secondary purpose was training: to enable expedition members to experience living and traveling in the open in Antarctica under winter conditions.

Mid-winter on the trail in the Antarctic

means coping with extreme cold, high winds, and darkness. High altitude added to the discomforts.

It was winter, so at this latitude of just over 68° south, there was little daylight. The sun had not yet begun to rise above the mountains along the northern horizon for any part of the day, so for a few hours each day we had twilight. In the white environment this faint light was enough to allow a short period of outside work or travel.

On the two-day outgoing trip to the plateau, Pete and I had been accompanied by four others as a support group: Finn Ronne, expedition leader; Bill Latady, aerial photographer; Chuck Adams, a pilot; and Arthur Owen, Boy Scout and dog driver.

Before the trip we had received valuable advice from the British team. Two members of our expedition, Ronne and Harry Darlington, had been part of an American

expedition that had established its base on Stonington Island in 1939, but British explorers had known the general area since the 1934 to 1937 British Graham Land Expedition. The 11

men we met when we arrived had already been on Stonington Island for a year. They had warned us that the going would be rough in at least three respects apart from the usual hardships of a polar winter.

One reason was the steepness of the



Robert Dodson today

slopes: we were attempting, with two heavily loaded sledges and fifteen dogs, to climb to an altitude of more than 5,000 feet within a distance of about 25 miles and to do so within a two-day period.

A second aspect was surface sastrugi. These, in places, greatly impeded the forward movement of dog sledges. Sastrugi are ridges in the snow surface caused by high winds. They can be up to ten feet long and more than two feet high with sharp, corniced ends, the whole often being as hard as ice. And they can be dangerous. Later that year our Nelson McClary, while traversing a glacier with his team, was thrown from a capsizing sledge onto sastrugi. He broke his collarbone and was disabled for the season.

A third aspect was extremely high winds. They are a common feature of the Antarctic continental periphery and their force can be disrupting, to say the least.

By mid-afternoon of the second day of our journey, total darkness, although momentarily starlit, was upon us. We continued the climb, occasionally using flashlights. At times, on the steepest slopes, we were forced to relay our loads, taking half a load forward and then doubling back to retrieve the second half—a time-consuming process.

At one point during the climb, when it became clear that we were already behind schedule, Finn Ronne ordered that we jettison some of the heavy gear that he considered to be unnecessary. One of the items

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left behind, far from the ridge top where we were going, was a British pyramidal tent, of a type that was standard equipment for all FIDS trail parties. I had chosen to include it as storm insurance while loading at the base.

The British tents were double layer, as were the pyramidal American tents, but of superior design. They were made of long-staple Egyptian cotton, closely woven by Lancashire mills that must have been among the most experienced in the world. Although this was before the days of synthetics, the windproof quality of their cloth was legendary. If one put it to the mouth and blew hard, no air would pass through.

But the tent was also heavy. So, at the end of our first day on the journey, it was unloaded and deposited in a cache for pickup and return to base after the trip.

On the second day one moment of calm and beauty stands out. It happened about 6:00 pm, in starlit darkness as our teams were coming over the lip of the plateau and the slope was easing as we headed towards our intended campsite. As we reached the lip, the sky to the southwest, in the direction of the South Magnetic Pole, began to glow with a dazzling display of the southern lights (Aurora Australis). We seldom saw the aurora from base because the magnetic pole was almost three thousand miles away, but from the plateau it was clearly visible. Fingers and curtains of light appeared in a shimmering variety of colors, including red to an extent unusual in the Arctic's Aurora Borealis. The display silhouetted the dog teams, their curved tails dancing against the colorful background. It was one of the finest sights we were to experience during our entire year in Antarctica.

After much effort by men and dogs we succeeded in reaching the mile-high plateau. Air temperature was well below zero (Fahrenheit) and the wind had slackened to 30 miles per hour (mph). After we made camp and experienced our first night on the plateau, a strong wind came up from the southeast, and blizzard conditions prevailed for the next week.

Once, during the second day on the

plateau, Pete Peterson, anemometer in hand, was unable to stand up to get his readings. Then, having been asked to check the condition of the dogs, he pronounced them all dead. He was unaware that, under such conditions, a sled dog will not leave its cozy snow hole despite multiple kicks from a boot.

The storm raged day and night for days on end.

Winds gusted above 80 mph (some said 100 mph!) with temperatures sub-zero (F) much of the time. (The even deeper cold for which Antarctica is famous occurs

mainly during periods of calm.) The din of flapping tent cloth, a ragged roar, inhibited conversation. The radio failed early on, probably due to a short circuit

from melted snow, preventing any communication with base. For

much of the time, normal meals were not possible; the stove and candles were made inoperative from drafts within the tent due to flapping of the sides and wind penetrating the canvas. We devoured bits and pieces intermittently from cold food stored in pockets and packs. And all this was going on, most of the time, in near total darkness.

"After eight days of the worst the Antarctic has to offer" (as Finn Ronne puts it in his book), the four-man support party, with all the dogs, was able to depart during a lull in the storm, arriving safely back at main base that evening. So

steep was the glacier in places that on the way down they were obliged to wrap the sledge runners with ropes to act as a brake. They made good time; it took them eleven hours to reach the base. This single-day journey was a credit to the experience of Finn Ronne who, in the course of his Antarctic career, had made long distance journeys and important discoveries by dog team.

After their departure the storm worsened. Confined to our sleeping bags for several more days, Pete and I conversed at length, having to shout at times because of the constant din of wind beating on the tent cloth. During long hours we exchanged views on innumerable subjects and told each other the story of our lives. It was a bonding experience. One thing we did to pass the time was to map out carefully in our minds the items we might need to pack in our rucksacks, and the route we would take, should weather conditions deteriorate to the point that rescue by air would be impossible and we would need

to retreat on skis to the base.

One

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of the many topics we discussed was equipment and clothing. This was of special interest to me as one of my expedition functions was to report on the performance of items that had been loaned to us by the Office of the Quartermaster General (OQMG), U.S. Army. This consulting opportunity had arisen only several weeks prior to our departure as a result of a recommendation to the Army by a former schoolteacher of mine who had been an officer in OQMG during the war.

Unlike most of us, who were more accustomed to body-warming physical activity in our daily work, Pete, whose outside activity had been largely the reading of scientific instruments, had got into the habit of clothing himself, when outside, in what we called the "Alpaca suit." He was often teased about this because it was heavier than most of us would have worn when exercising.

Although heavy, the Alpaca suit was the warmest item of our wardrobes. One suit had been issued to each member of the expedition, and we had enough spares to equip each of the

British team as well. The suit had been designed for late-autumn duck hunters who can be immobilized for hours in sub-freezing cold and pre-dawn darkness in blinds on the lakes of the Upper Midwest. The suit had bulky pants and a hooded jacket, and was lined—top to bottom—with 100 percent Alpaca fur, which was claimed to be the warmest animal fur in the world. These suits had been a promotional gift to the expedition from the manufacturer.

The expedition's meager budget would not have allowed their purchase.

Throughout those days I became impressed by Pete's intelligence as well as his courage. A first lieutenant in the Marine Corps Reserve, he displayed a noble calm in the face of danger. We were both fearful, of course, but never to the extent that it clouded our judgment or affected our behavior. We accepted our situation as a challenge. We were at the mercy of the elements but were determined to do everything possible to resolve our difficulties and—one way or another—to survive the ordeal.

On the morning of July 26, in continued strong winds, the tent began to unravel at the base of one of the four main seams.

We were alarmed.

Years later, FIDS surveyor Kevin Walton, in his book *Two Years in the Antarctic*, wrote that our troubles resulted primarily from equipment inadequacies. He also pointed out that our other two tents—which had been erected while the support party was still with us—had

proved inadequate; one was not sufficiently windproof and the other (a duplicate of one that had blown down on the plateau in 1940) had collapsed in the storm. The tent that Pete and I were using withstood the storm longer because its seams had been reinforced and its height had been shortened, thanks to the kindness of Kevin, who had spent hours working on it with a sewing machine just a few days before we departed.

We accepted our situation as a challenge. We were at the mercy of the elements but were determined to do everything possible to resolve our difficulties and—one way or another—to survive the ordeal.

To close the tent seam was not possible under the vibrating conditions, and the rip was lengthening in such a way that the whole tent could have been blown away in a moment. Its destruction could have meant our doom. We yearned for the FIDS tent, now cached at the bottom of the glacier. Without a tent, living off the land was out of the question. This was an inland journey without natural shelter of any kind; there were no seals, penguins or other birds to be had for food. We knew that an old British sub-surface cache of supplies existed a half-mile away, but adverse conditions of weather and darkness prevented us from trying to find it. We also knew that an aircraft might be looking for us should the storm weaken. But abate, it did not.

Then, at midday on July 26, a lull appeared. With the tent seriously damaged and no assurance that the storm would not return within hours and continue for days, we decided to take the action we had earlier discussed.

We packed our things into rucksacks. After grabbing a quick (although uncooked) meal, we abandoned the tent.

Roped together, we left the camp in the midday twilight. We struck out on skis, northwest at the start, for the main base, which was some 25 miles away down the glaciers. We had flashlights but were cautious about using them until total darkness came upon us.

About an hour later, while it was still twilight and during a rare moment of improved weather, we were descending from the plateau towards the glacier that would be our main avenue to safety, when the sound of an aircraft engine became audible above the howling of the wind. We caught a glimpse of the plane. It was our

The dreaded sastrugi impeded progress on skis. (Courtesy of Kevin Walton, FIDS)

L-5 light observation plane. We learned later that Chuck Adams was at the controls. But wind and surface conditions would not have allowed it to land, and radio communication was not possible.

Chuck later reported that he and then-chief pilot Harry Darlington, each flying scouting flights in the little L-5 aircraft that day, had encountered exceptionally strong winds near the plateau edge.

Chuck had made a second sortie—approaching from the south, thus inadvisable to us—which had involved him in what he later referred to as one of the riskiest flights of his career. (His war experience had included encounters with Japanese aircraft in the China-Burma-India theater.) At times, heading for our camp at the maximum speed and angle of climb, the downdrafts pouring off the lip of the plateau were stronger than the plane's ability to climb and he found himself losing altitude. His only recourse was to turn sharply and sweep back (westwards, toward base) at high speed in order to climb again, this time to several thousand feet above the plateau. He could then make progress eastwards to cross the plateau. He then had to turn 180 degrees while descending to be able to fly over our camp downwind, albeit at great speed.

During the prior days of discussion in the tent, Pete and I had thought of marking a landing site in the snow. But vulnerability of surface markings to wind erosion, the unlikelihood of rescue, and a plane's inability to land safely on the windswept and sastrugi-scarred surface, had deterred us.

However, we wanted to let the pilot know we were both alive and were leaving the camp. So, seeing the plane at what seemed to be an appropriate moment when the pilot might be looking our way, we released our smoke bomb. But the smoke, unable to rise because of the wind, was carried downwind in a faint streamer of red that, being parallel to the lines of sastrugi, failed to stand out sufficiently to be visible from above.

We were now entirely on our own, with more than 20 miles to go and daylight fading. Our greatest concern was the gathering of clouds to the southwest (in the direction of our base), which raised the possibility of

a resumption of the storm that had imprisoned us for so many days.

Just after we unsuccessfully released our smoke-bomb, as we were coming off the plateau and were negotiating a steeper slope, we wandered off course, finding ourselves amidst a jumble of crevasses.

We were roped together, as we had been since the beginning of the descent from the plateau, and gradually we managed to extract ourselves from the crevassed area. This required retracing our steps for some distance in order to regain the more crevasse-free route under steep slopes on the south side of the glacier.

We continued west down the glacier. The wind, although by now only occasionally at gale force and fortunately blowing from behind us, was strong and gusty nonetheless and sometimes knocked us off balance. Visibility was intermittent. For much of the time we were immersed in a swirling mist driven by the winds pouring down from the plateau. At times the clouds would thicken but we were able to press on. Eventually, hugging the side of the glacier beneath steep slopes on our left, we were able to see, despite the mists

and failing light, a line of large black rocks as a guide. The rocks had fallen from the cliffs but had not yet sunken into the glacier and thus remained visible in the gloom.

We knew about, and could occasionally see, a bold rocky point some miles away down the glacier. It was a key landmark and intermediate goal.

We knew that a few miles beyond the rocky point, the Northeast Glacier would open up into a widening slope of ice that led down toward Marguerite Bay, where it met the sea in a jumble of crevasses and ice blocks. Our base camp was about ten miles



Kevin Walton (FIDS) at his sewing machine, reinforcing our tent, in July 1947. Bob Dodson is looking on.

COURTESY OF ROBERT DODSON

from the rocky point down the slope, and was accessible over a relatively narrow and smooth ice ramp that ended on Stonington Island (see map on next page).

The intermittent low visibility was troubling. Should the storm resume and clouds intervene, the guiding line of rocks would help us reach the rocky point, but with difficulty, as we would have to hug the base of the steep slope to our left in obscure conditions in the dusk.

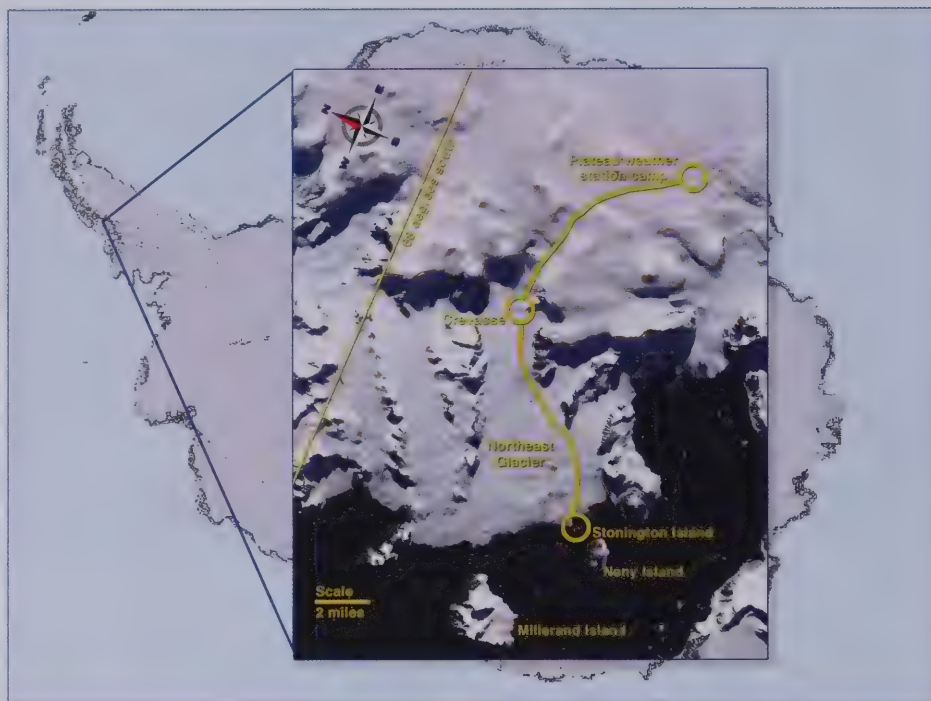
But the biggest concern was that if the weather remained stormy with consequent poor visibility in the gathering darkness, we would be unable to obtain a compass bearing on the summit of a prominent feature known as Millerand Island, which was not far to the west of our base. Another feature, Neny Island, which was mountainous and lay directly behind our base, might also be visible. Both features were good landmarks to ensure a return journey.

If we could get to the rocky point with enough daylight left to see at least Millerand Island and get a compass bearing on it, we would be able to reach the base. Once we had that compass bearing, we could proceed even with zero visibility and in total darkness, just using flashlights to read the compass so that we could maintain the heading.

Getting that bearing had therefore become to us a matter of life or death, obliging us to take whatever risks might be necessary to achieve it.

As I was leading us down from the plateau, my mind was occupied with calculating distances, the probable amount of remaining light and visibility, the delaying obstacles we might encounter, and what

Getting that [compass] bearing had therefore become to us a matter of life or death, obliging us to take whatever risks might be necessary to achieve it.



Inset showing the escape route as well as location of Stonington Island.

action we might take to avoid becoming entrapped by darkness. Pete and I discussed these concerns and agreed that, in an emergency, for the sake of regaining speed we might resort to a radical course of action—removing our skis to proceed on foot as far as the rocky point.

As we descended, we were careful to keep to the southern side of the glacier, which was to our left, in order to avoid, or at least minimize, crevasse risks. On the way up both Ronne and the British had told us that this southern route was relatively free of crevasses, and we had observed that route ourselves during the uphill climb.

In the course of our descent from the plateau it had become apparent that on that day, Pete Peterson, although in good spirits and uncomplaining throughout, was weaker and less alert than normal. During the nights on the plateau he had been cold in his sleeping bag (possibly because of water spilled from a cooking pot), and he had slept poorly. Despite his courage and toughness, this had sapped his energy. And he lacked previous exposure to mountaineering, skiing, and navigation. One purpose of the plateau journey had been training in these regards, but this trip, in retrospect, may have been an overdose. In any case, on the glaciers that day I always went first and Pete followed in my tracks.

From the start we were on skis and roped together. The rope, some 120 feet

(about 40 meters) long, was a safeguard but by no means full insurance should one of us fall into a crevasse. It would have been a struggle, and not at all certain, for one person to pull the other out, and in case of a deep fall the second man could have been pulled into the crevasse by the first, especially on the glare ice surfaces.

We realized that at the rocky point the steep slopes to our left that were helping us navigate would end. Beyond that, if we were unable to get a compass bearing because of either clouds or darkness, all might be lost. Speed, therefore, was essential. But as we came closer to the point, where prevailing winds were strongest, we encountered serious delays because of large sastrugi.

As we advanced it was becoming apparent that, unless we were able to significantly increase our speed, we were not going to reach the rocky point in time. This presented a dilemma: Should we adhere to accepted wisdom by staying on skis and using the rope, at the risk of failing to get the critical compass bearing, or should we break a cardinal rule of mountaineering in order to be sure we could reach the rocky point in time—but at the risk that one of us might fall into a crevasse with no rope as backup?

Normally, on glaciers, skis and ropes are used as safeguards against falling into crevasses. But, for us, the skis and rope began to cause frequent delays. Gradually, as we progressed, it became apparent that Pete, more fatigued than I, was unable to main-

tain a normal pace, especially as the rope, dragging on the ice between us, was continually snagging on the sharp windward ends of the sastrugi. Each snag became time-consuming, necessitating retracing our steps to free the rope. This had not occurred on the way up because the leeward ends of sastrugi are smooth, whereas the windward ends can have sharp icy prows that can ensnare a dragging rope. Wind on this trip always came from up the valleys.

Additionally Pete, being an inexperienced skier, found that the wind-induced washboard roughness of the glacier surface made skiing difficult. He often fell down on the sastrugi-roughened surfaces, which were becoming worse due to wind-funneling effect of tributary valleys as we neared the point. The heavy weight of his Alpaca suit may also have been slowing him down.

We made our decision. Realizing that our slowing progress would prevent our getting a compass bearing before dark, we exercised the option of removing our skis. I coiled the rope over my shoulder and dragged both pairs of skis behind me. Pete kept his own poles and carried our single ice axe. Our intention was to resume using both skis and rope after we had rounded the rocky spur, had obtained the compass bearing, and had emerged onto the main body of the Northeast Glacier.

Our decision to forego the use of both skis and rope was, to say the least, highly unorthodox. But it did have the effect of greatly increasing our speed. Looking back across the years, recalling how critical was the time element as total darkness was about to engulf us, were it today I believe I would have done the same. Time was of the essence; our lives depended on reaching that rocky point before a resurgence of the storm (something we had seen happen often in recent days). If the storm returned it could deny us the chance of getting a compass bearing that would lead us, even in clouds and darkness, towards the base. Failure to reach the point could have had fatal consequences.

Moments later we had a scare. While traversing the flank of a large sastrugus, I fell into a wind-formed depression on its far side—dragging the skis after me. This understandably gave Pete, following behind, the impression that I had been swallowed by a crevasse. My own recollection is that the episode might not have happened had I been making fuller use of my flashlight, which had been turned on only inter-

mittently so as to conserve the batteries for the time when it would become fully dark.

As we approached the rocky point the wind-scoured surface of the glacier became largely all ice, the remainder consisting of hard snow so wind-packed that it had the texture of rough ice. On such surfaces, and buffeted as we were by the wind, it was not easy to stay upright.

At last we reached the point. Although we were now in darkness except for faint intermittent moonlight from the sliver of a new moon poking through holes in the clouds, a momentary clearing of the weather did enable us to get a compass bearing on Millerand Island. It gave us all we would need for navigation even if the storm and clouds should return. To have obtained that vital bearing was an enormous relief; it seemed that our troubles were over.

Having attained the point, we advanced perhaps a quarter of a mile further. Before us lay the Northeast Glacier. All we needed to do was to skirt its left (southeastern) side so as to stay clear of the larger crevasses, then head for base camp, which was now only some ten miles away.

It was time for a rest. It was also time to take advantage of the relatively smoother surfaces of the Northeast Glacier by resuming use of skis and the rope. I knelt down to slacken my bootlaces to relieve the cold in my feet. Although not as severe as on the mile-high plateau, the temperature must have been subzero (F) at the time, in keeping with norms of the Antarctic winter. This was still-air temperature; the wind-chill temperature would have been lower. While I was occupied with my boots, Pete, for the first time in the journey, moved forward, ahead of me. He was now to my left and some twenty feet away.

I heard a sudden gasp. I looked around. I could not see Pete. It was evident that he had fallen into a crevasse.



I stood up and walked towards the place where I had last seen him. The evidence was clearly visible: a black hole a bit larger than the size of a manhole cover in the surface of the glacier. I approached the hole gingerly, examining the surface by the light of my flashlight and aided by fleeting moments of faint moonlight. I was hoping that Pete had not fallen far and could, with effort, be pulled out. But I was appalled to discover that he had stepped onto the sur-

face of a major, fully-snow-bridged crevasse.

The Northeast Glacier had been so scoured by wind that the surface was largely bare ice, sprinkled with occasional patches of hard wind-packed snow. This helped to make clear the outline of the bridged crevasse. It was visible as a six- to 10-foot-wide ribbon of snow running across the ice of the glacier from left to right.

The hole was near the closer edge of the ribbon of snow. What had happened was clear. The bridge, not strong enough to hold Pete, had broken, and he had fallen through. The crevasse was so wide that it was probably very deep, perhaps hundreds of feet. It was possible that he had fallen to his death.

There was no apparent way around the crevasse in either direction. Pete's unfamiliarity with glaciers, and his fatigued state, had led to his misstep. Had we been roped, and considering the icy surface, I might well have been dragged into the crevasse along with him, in which case there would have been zero chance of our survival.

When I approached the hole and looked in with a flashlight, I could not see him. He had fallen far. But he was alive. I could hear his voice calling faintly from the depths.

He asked for a knife. I could barely hear him, but enough to understand that the rucksack had jammed him between the narrowing walls of the crevasse and the straps were painning his shoulder and part-

ly immobilizing his arms. He wanted the knife to cut the rucksack straps to relieve the pain and possibly free himself to move around.

I lowered one end of the rope with a knife attached. But he had fallen so far that it did not reach him. I then retracted the rope, removed the knife and let the rope down again after placing knots in it at short intervals in case he should be able to try to climb out. As a means of anchoring the rope I placed his skis across the crevasse. The crevasse's width at that point barely permitted it. But the hard icy surface of the glacier did not let me dig them in vertically. I tied the skis to the other end of the rope. I placed the several trail flags that had been in my rucksack as emergency gear into the snow of the crevasse bridge.

Although it might have been more practical in such a situation to have placed the flags in a straight line along the length of the crevasse, thus increasing chances of their being seen by a search party, I was reluctant to do so out of concern about possibly slipping into the crevasse myself from the icy borders on my side, which was uphill.

It is interesting to conjecture that, had we stopped for a rest slightly beforehand, or even slightly later, the outcome might have been entirely different. Had we stopped sooner, we might have encountered the crevasse while on skis again after the rest stop, which would have greatly lessened the



DICK BUTSON AND KEVIN WALTON OF THE FIDS GROUP WITH THEIR DOG TEAM—September 1947, two months after the crevasse rescue in which they both played important roles. Note the sealskin mukluks, the glove harnesses, and the rope lashings of gear on the sledge, all reminiscent of a Scott or Shackleton scene.



Americans (Ronne Expedition) and British (FIDS) watching a movie at base camp on the night of July 26, 1947.

chances of falling in. But had we stopped a moment later, with Pete in his usual position behind me, I probably would have recognized the snow bridge as the sign of a dangerous crevasse, as I did even from a distance when I walked up to the hole. In that case I would have focused my attention on finding a way of circumventing or crossing it. Conjecturing further, it is probable that in the midst of the storm on the plateau, had we been using the stronger FIDS tent that had been jettisoned to lighten the sledge on the outward journey, we might not have needed to abandon our camp and the crevasse episode might never have occurred.

Unable to assist Pete, I took compass bearings to mark the spot and then put on my skis in order to cross the crevasse. The crevasse was so wide that it was not certain that I would succeed. I backed up some fifty feet, then threw myself forward at as fast a pace as I dared; I did not want to come on it so fast that I might lose my balance. And cross it I did.

The time was about 7 pm. The base was about 10 miles away in the depth of the winter night with intermittent faint moonlight. I left the crevasse and started back.

Fortunately, the route the initial group had taken coming up the glacier curved around most of the crevasse field, so I followed that route. The crevasse Pete was in was the last one of any size all the way back to base. My progress was unimpeded, speeded by the icy surfaces and a generally downward slope. In less than three hours, at about 9:30 pm, I arrived outside the back door of the main building, removed my skis and walked into the welcome warmth of a crowded room.

Since it was a Saturday night, the British were over for a movie. It was "The Buc-

caners," a saga of the pirate Jean Lafitte in the Caribbean. Palm trees flickered on the screen as I entered the building from behind the screen. I must have created a sensation standing there in the light of the projector in the iced clothing that I had not changed in a week, with ice-encrusted beard, my lips and cheeks showing the effects of frostbite, and the fur brim of my hat covered with ice from frozen breath that had gathered during more than ten hours in the open.

Our expedition was well-photographed, but in the excitement of the moment, and considering the gravity of the situation, no one bothered to take a picture, then or later.

I announced to the group that Pete was down a crevasse about ten miles up the glacier from base, and that I could lead them to it but first I would need something to eat. Curiously, although I was hungry and tired, I did not feel totally exhausted. Perhaps my energy was maintained by the sudden immersion into a familiar group of people, and the realization that I had completed a hazardous journey and was the key to possibly saving a friend's life by leading others to retrieve him. My general physical condition at the time may also have been a factor; unlike Pete and other scientists whose winter duties outside were largely observing instruments, my daily attention to dogs and regular exercise with dog teams may have conditioned me to a higher degree than most. Finally, Pete's own character helped sustain my resolve. He had shown such indomitable courage, in the tent and on the trail, that he deserved the best effort all of us could muster.

The projector was turned off and all was a bustle. Within minutes, a joint American-British rescue plan was being discussed and a steak dinner had been laid out for me on the big table. As Finn Ronne puts it in his book, "Between bites he told his story."

The British offered help in the form of dog teams, two of which were ready to go

on short notice. Organizing our own team for the night's work would have taken much longer. I was the expedition's chief dog team driver, but I had to accompany the scout party, so I could not have helped organize the dogs for a rescue.

The British had developed their standby tactic, which was similar to having a fire brigade on hand, as a result of their own crevasse emergencies in the past year. On one occasion their deputy leader, John Tonkin, became pinned tightly inside a crevasse and was freed after many hours of very hard work—chipping with an improvised tool—by colleague Kevin Walton, who later received the Albert Medal (eventually to become the George Cross) for his feat.

Also on hand at the FIDS base for emergencies such as this was rescue equipment such as portable searchlights called "Aldis lamps." Together with heavy batteries, they could be fixed onto the front of a dog sledge.

While the teams were being readied I gulped down my meal, then joined an advance group of three other Americans to ski together up the glacier to try to locate the crevasse. We roped ourselves together because we would be using the shortest route, which might involve taking shortcuts through crevassed areas that I had managed to avoid on my way down.

Bill Latady led the way, guided by my instructions and compass bearings from the rear. In between us were Ike Schlossbach, deputy expedition leader and Harry Darrington, then-chief pilot who had driven dog teams on a Byrd expedition. The rope, which was made of nylon (a wartime development) was somewhat elastic. Since I was slower than the others because of fatigue from many hours in the open, I felt tugs from time to time, but they felt similar to being tugged by a rubber band as the rope dragged me along gently to keep the pace.

We took the direct route, not the crevasse-avoiding one that I had used on my descent. Therefore, we encountered crevasses from time to time. But Bill Latady, a member of the American Alpine Club and also president of the Harvard Mountaineering Club (of which I was vice president), negotiated them successfully. Unfortunately, one of the two dog teams behind us had three of its dogs fall into a crevasse. They had hung suspended by the harnesses attaching them to the other dogs and all could have been rescued, but

one of them, in panic, had bitten through his harness and had been lost.

By this time it was after midnight. Thankfully, the weather had improved—the first such clearing in more than a week. We were now skiing under the stars and an intermittent sickle moon, over a surface of mostly glare ice laid bare by the storm winds. The glacier was streaked with sastrugi and elongated patches of hard-packed snow that had the texture of ice.

Eventually, with the dog teams approaching from behind us, we came to the general area of the crevasse. But we could not see the hole. The small size of my pocket compass meant that the bearings I had taken—good enough to locate our base with its noisy generator and lights—were not precise enough to lead us to a single small hole. So the area of possible location of the crevasse was sizable, extending over several acres.

Furthermore, we were now in an area near the junction of glaciers where the funneling effect on the wind had been exceptionally strong, meaning that sastrugi were everywhere. The moon had become obscured behind a mountain, and the starlight on the white glacier caused a welter of confusion as the sastrugi cast shadows throughout the eerie landscape. In the faint light and in the confusion of shadows, my trail flags could not be seen. There was not enough light for their colors to show, and their shadows were indistinguishable from those of the sastrugi around them.

To complicate matters, we could find no tracks. In this case, because of the hard ice surface, we could find no trace of my journey from the hole to the camp.

For more than an hour the rescue party zigzagged back and forth within the area of the compass bearing, frustrated by our inability to find the trail flags that marked the hole in the snow bridge where Pete had fallen in. Finally, Ike Schlossbach noticed a scratch on the ice ... then, about ten feet on, another scratch. Apparently my skis had left a very faint trail, an occasional small scratch on the ice, every ten to twenty

feet, whenever I had edged them to control my descent. The trail of scratches led to the flags.

We reached the hole about nine hours after I had left it. Though we shouted, there was no sound from below.

Quickly, a sledge was placed across the crevasse, upside down to facilitate the placement of rescue ropes and gear. A block and tackle, with extra rope, was rigged so that a man could descend on a rope and be hauled out using the pulley. The crew placed an Aldis lamp so it shone down into the hole.

"The Aldis lamp [gave] excellent illumination from above—light being reflected by the ice," wrote British doctor Dick Butson in a later book, *Young Men in the Antarctic*.

With the bright light, we were able to spot Pete's body. In his book, Dick described what we saw. Pete's body, he wrote, was "wedged and rather crumpled, a very long way down."

We could not see any movement.

Both doctors were in the rescue party. Dick Butson was the smaller of the two, so he was chosen to climb down to Pete because he would be able to maneuver with less difficulty in a constrained space. He

All of us expected him to find that Pete had died. It seemed unlikely that anyone could have survived a fall of such depth followed by nine hours in such cold. Finn Ronne, while conversing near the crevasse with the British leader, Ken Butler, was overheard worrying about what he would say to Pete's parents, who were longtime friends. When Dick Butson started down the rope he had asked, "What should I do with the body?" Ronne had replied simply: "Leave it there until I notify his family."

Dick finally reached Pete, after much difficulty in the narrowing crevasse. Dick's shout was barely audible:

"He's alive! Very much so, in fact. He's talking."

We all felt a burst of relief.



But now we were concerned about possible harm Pete might have suffered from injuries on the way down, as well as effects of the prolonged cold, not to mention psychological effects from what must have been the ultimate hellish experience.

Pete, tough Marine that he was, communicated clearly with his rescuer. Dick Butson, in his book, describing his hour spent with Pete at the bottom of the crevasse wrote that "he had shown amazing courage and kept his head throughout."

Dick managed to fix a rope around Pete. Finally, after much tugging by several men on top, he was pulled loose.

He bobbed upwards "like a tooth being plucked from its socket" as Ronne described it. Once on the surface, he was hauled into a tent that had already been set up as a medical clinic, a first aid station with a Primus stove roaring in the center for warmth.

To everyone's surprise, examination by both doctors showed that no bones had been broken, although there were multiple bruises. Pete's face and head were scratched and bloody in places. One arm was limp.



The rescue operation at the crevasse, July 26, 1947. Actual width of the crevasse was greater than here depicted.

had also been involved in the crevasse rescue of the FIDS deputy leader John Tonkin the previous year. Furthermore, he was an experienced mountaineer, accustomed to working with ropes and ice axes in an icy and mountainous environment. And finally, as a medical student in London during the war, he had helped rescue victims from the rubble of air raids. (See *Endnote 2*)

Down he went on the rope into the crevasse, for what seemed a very long time. No sound emanated.



Caption: M.R. Lander and Janet Rouse

Pete Peterson in his bunk several days after his rescue from the crevasse.

As to the effects of cold, our geologist, Bob Nichols, had foreseen no serious effects: glaciers, he pointed out, tend to warm with depth because of the pressure of the ice above, so ice temperatures at or near their bottoms are little if at all below freezing. This was borne out by the experience that both Pete and Dick had in the glacier. Dick later described the temperature as “beautifully warm,” meaning only a few degrees below freezing. He was able to work with bare hands.

It turned out that Pete, despite the loss of a glove in the fall, had no frostbite except in a few places on his hands and face, and even there not to a serious extent. Another reason for his survival may have been his clothing: the Alpaca suit for which he had so often been ridiculed.

During several days of recuperation following the accident, Pete recounted his experience in the crevasse. He must have ricocheted from side to side while falling and this had lessened the impact when he finally stopped, jammed between narrowing ice walls. The crevasse walls were not always parallel and there may have been intermittent snow bridges that helped to slow his fall. At depth in the narrowing crevasse he had become wedged horizontally, face down. (Not head down as some were to claim, as the effect of blood to the head could have killed him in time.) One shoulder was pained by pressure from a strap on his rucksack and it was a full week before he regained use of one arm.

While he waited in the crevasse, the apparent hopelessness of his situation, from the start, understandably had a shock effect on Pete’s psyche. He became confused and depressed, contemplating a slow and lingering death. Eventually he

convinced himself that I also had fallen in and that therefore all hope was lost. In that case there was no way that we could have been found. Drifting snow would have covered the hole. Even if a portion of the hole had remained open for several days,

its tiny presence in the vast landscape, itself jumbled with sastrugi, would have been a needle in a haystack for a searching aircraft or a ground party. In any case it would have been unlikely that a surface party would have explored in that area due to the absence of tracks and the distance from our tent on the plateau.

Pete later described his fall as having been one of extreme bad luck followed by tremendous good luck after an intervening period of torment. He told me that had my knife reached him, he might eventually have tried to end his life. After having given up hope of rescue and having convinced himself that I also had fallen in, to end his suffering he would have used the knife to cut his wrists and shorten his misery.

After several hours, in the face of continuing pain from his shoulder and the effects of his confinement, he had slipped into a delirium from which, occasionally, he would revive. During one of these conscious spells he heard the sounds of the search party—the tick-tack of their ski poles transmitted through the ice. He later told me that the sounds of them approaching and then fading away as the search party zig-zagged across the glacier, were some of his worst moments.

After I returned to camp, I found that my own memories of that rescue and the extraction of Pete from the crevasse were fragmented. For much of the time, after discovery of the hole, I was away from the action. Long hours of exposure had caused my feet to become colder and colder until—by the time we had found the hole—they had been numb for some time. The rescue party had brought along multiple supplies of key items of equipment, so an-

other tent was set up for me. It was warmed by a primus stove, and Dr. Don McLean tended to my icy feet. But once warmed they became swollen and would no longer fit into my boots. Extra pairs of socks and a felt cover were used instead of boots for the return journey to base.

I rode atop a sledge. The dogs, now sensing that they were heading home, pulled lustily across the frozen landscape until, within a half mile of base, the runners collapsed from the beating they had taken on the sastrugi, from my added weight and from the extra speed of the homeward-bound dogs. I managed to walk the short remaining distance in my stockinged feet.

Pete was on another sledge but its runners must have been stronger. He was carried directly from sledge to bunk. By this time, around midday, twilight had arrived and there was slight visibility.

On the day following, we asked ourselves whether the accident could have been avoided if Pete and I had simply remained in the tent, awaiting calmer weather and the prospect of an air drop of supplies, all the time coping with the enlarging rip in the tent seam. But we had been so pummeled by the wind for so many days, and had experienced so many lulls followed by renewed storm, how were we to know that the lull on July 26 did indeed presage improvement?

It has since been established, through years of research, that a storm in the Antarctic rarely lasts as long as a whole week, but this could not have been known at the time. The longer periods of intense storm reported in Captain Robert Falcon Scott’s diary of his trip to the South Pole were fresh in our minds.

In the days following the accident, I submitted to Finn Ronne, at his request, a written report of the crevasse episode and the reasons for the decisions that we had taken enroute. But the information I gave him did not appear in his subsequent writings.

Both Ronne and Walton remarked in their books about the number and proximity of crevasses in the area where Pete had gone down. Actually, “Pete’s crevasse,” as we came to call it, was the last of its kind on our escape route. It was an anomaly, extending outward—in a southeast direction across our route—from the maze of crevasses that characterized the main body of the glacier. To the rescuers, grop-

ing in the darkness, it may have appeared to be part of the maze because they had used a direct route through frequent crevasses, not the circuitous one that I had followed on my solitary return trip and which Finn Ronne, on the outbound trip, had called to my attention.

Once I had crossed Pete's crevasse on skis following the accident, I encountered not a single large crevasse for the entire distance of the journey home. It had been the last dangerous obstacle, its bridge clearly noticeable. Had Pete not strolled to the side and ahead of me during the rest stop or had I—before stopping to loosen my boot laces—walked a short distance, where I would have recognized the telltale signs of the crevasse's presence, the accident might never have occurred.

Dick Butson was later awarded the Albert Medal, the same Kevin Walton was given for his role in the earlier crevasse rescue. Both men were to benefit years later when their Albert medals were merged into the same category as the George Cross, Britain's highest civilian award. By that time it had become a custom for holders of the highest military and civilian medals—the Victoria Cross and the George Cross—to be entertained together every two years at Buckingham Palace. These gatherings enabled Walton, who also had been highly decorated in the wartime Royal Navy, to become so well known to the royal family that the Prince of Wales later agreed, on two occasions, to write the forewords to books co-authored by Walton. One of these, *Of Dogs and Men*, became a classic on Antarctic dog sledging.

When we returned to the United States in April 1948, it was apparent that the Ronne Expedition had exceeded its goals in terms of geographical exploration. A previously unseen area of 250,000 square miles—greater than the size of France—had been added to the map. And overall we had been lucky.

The crevasse episode was only one of several close shaves. The first had occurred near the start when the expedition's largest and most valuable aircraft had been destroyed in a loading accident on the docks several days before departure. Fortunately, thanks to Finn Ronne's characteristic initiative in a crisis, it was replaced soon afterwards at little additional cost to the expedition.

On another occasion one of our men, while working on a radio antenna proj-

ect, had fallen off a fifty-foot ice cliff into seawater and was able to survive until he could be extricated, despite having an already-broken arm in a cast under his jacket.

At yet another time, Chuck Adams had survived an encounter with a revolving aircraft propeller, which hit him in the head but caused only a scalp wound.

The expedition's ship, which originally had been a sea-going tugboat, also had a close call on the return voyage. Off Cape Horn, amidst the din of creaking timbers of a wooden ship in a storm, the ship at one point rolled 54 degrees, barely escaping a disaster that would have recorded the expedition in Antarctic exploration annals as "lost with all hands."

In retrospect, it is intriguing to imagine that the expedition leader, Finn Ronne, may have possessed a subconscious sense about taking risks. He was not rash. He knew how to play it safe when the situation required, as when he rejected a suggestion by senior pilot Jim Lassiter that an attempt be made to fly to the South Pole and back. In theory we had the resources to do it, which would have established us as the first to set foot at the Pole since Captain Scott's party in 1912. In that case, Ronne said no, but, on at least one long exploratory flight, he had approved landing on unknown surfaces in the field that were out of range for rescue, correctly guessing that takeoff would be possible. His decision shortly before departure from the USA to take two women—the first ever on an Antarctic expedition, which was considered by some to be a risk at the time—also proved successful.

Napoleon, it is said, when asked about the qualities of a successful general, named luck as the first requisite. Who knows—perhaps one aspect of leadership is a subconscious sense of the inherent luck embodied in a given situation. Finn Ronne, although dogged by leadership problems that are well documented elsewhere, may have been well-endowed in terms of this most intangible aspect of leadership, possessing to a high degree what might be called a good poker player's sense for the element of luck in decisions.

Despite the hazards experienced on the Ronne Expedition and exposure to multiple hardships, for many of us the aura and beauty of Antarctica left an indelible impression. Paraphrasing an article I wrote for a bulletin of the American Geographical Society in 1956, which drew on a quota-

tion from Lord Hunt relevant to the Himalayas, I could reminisce:

"What do I remember now, looking back across the gap of so many years to those moments of great living in a distant land? I remember the crevasses, the wind, the great white slopes, the cries of seals and penguins on the continent's seaward rims. I remember the silence. But I remember most, and shall ever evoke, that sense of peace, transcending human care and the violence of the wind, that reigns in those lonely places, a peace whose element is beauty, raising the spirit of man above his baser self towards the eternal." ¶

ENDNOTES

Endnote 1: Books that mention the crevasse story:

- Antarctic Conquest (Ch. 6), Finn Ronne, 1949.
- Two Years in the Antarctic (Ch. 12), E.W. Kevin Walton, 1955.
- My Antarctic Honeymoon (Ch. 24), Jennie Darlington, 1956
- Antarctica's First Lady (Ch. 10), Jackie Ronne, 2004
- Young Men in the Antarctic (Ch.4), Dr. A.R.C. Butson, 2010
- The Life of a Swordfish Flyer (Ch.16), W.T.Thomson, 2011

Endnote 2: In a humorous background text written by the FIDS team, entitled "Who's Who in Antarctica," Dick Butson's entry, speaking in the third person, had stated "Acquired his macabre mentality digging for stiffs in the Blitz."



Robert Dodson in Antarctica, December 1947

As assistant geologist, surveyor and chief dog team driver, Bob Dodson at age 21 was one of the youngest members of the expedition. After the expedition, his career was largely in international business. He lived and worked much of the time overseas in Europe, India, the Middle East and Africa. He has been a frequent lecturer on cruise ships. He was featured in *The Polar Times* (January 2012) in the series "Within Our Ranks," which includes further information on his background.

was 64 hours of no sleep, focusing on saving lives. Apparently someone had placed wet clothes on a heater to dry and it had caught fire, killing three men in their cabin. There were seven others who were badly burned or otherwise injured who needed urgent medical attention. The fishing vessel was Korean, but the 40-some crew members were mostly from Indonesia and Vietnam. We had a scientist on board the NBP who was Vietnamese. We also had Filipino crew members aboard, and between them and the grantee, we were able to communicate with the victims. The best part is that everything worked out okay. The seven people we medevac'd to New Zealand lived. The large and diverse team effort was vital to this success, as it is with all our operations on the Ice.

I learn something new during every cruise. This is one of the reasons I enjoy sailing. I learn from the successes, and I learn more when something doesn't go well. Whether one is learning new technology, meeting new people, learning something new in science, or talking about a travel adventure, it is all there for the taking if you open yourself up to the experience. That's what keeps me coming back. If it was just a paycheck, it would be just a job. But it is so much more.

One of the things I really like about my job is the lifestyle it allows me to lead. I work staggered cruises, and that allows for chunks of free time off. I fly to meet the ship, typically in Punta Arenas, Chile (our main Peninsula logistics port), and spend a few days meeting with the outgoing MPC to find out what needs attention and what issues there may be. Then I take over responsibility for the cruise, working with our warehouse personnel in Punta Arenas to ensure everything gets loaded on the ship and staged for operations. The hours are long, and I am intensely focused on the job every day while aboard but once finished with the cruise, I can fly home and have a month or so off. You can accomplish a lot in your personal life when you have more than a weekend to do it in, and you need that time if you are continually away from home for long periods.

The longest period of time I've worked

as the MPC on a science cruise was close to three months, which is considerable when you work seven days a week and are on call 24 hours a day. Six weeks is a more typical cruise.

I always tell people it is a privilege being here. Sure, it's a job. But it really is a privilege to work in Antarctica. I am grateful for this experience, all the positive ways in which it has shaped me and the opportunity to work

with incredibly diverse, talented and wonderful people. ¶

I always tell people it is a privilege being here. Sure, it's a job. But it really is a privilege to work in Antarctica.



Antarctic Peninsula Logistics Manager Ken Navarro poses at Palmer Station with the Marr Ice Piedmont glacier in the background.

Ken Navarro

My interest in Antarctica began at age 10 while I was cleaning out a storage shed with my father. While opening boxes, my father found a box of matches that was given to him by a WWII buddy named Everitt Merritt. Everitt was stationed at Little America with Admiral Byrd and brought the box of matches back and gave them to my father as a souvenir. Seeing this relic from Little America and hearing the stories of my father's friend opened up a whole new world to me, and I never forgot about that day or the impact it had on my future.

As with so many USAP employees, I found out about the United States Antarctic Program through a friend of a friend and applied for a General Field Assistant position with ITT Antarctic Services. Although I was passed over for the General Field Assistant position, I was later hired as a Preventive Maintenance Mechanic to deploy to McMurdo in 1989.

Arriving at "Mactown" was quite a culture shock back then. The station population was at least 50 percent US Navy and

a mostly male population. It definitely had a military feel about the place. I was quartered in the "Nine Pack" Jamesway tents. My room was a space of about 7' x 6' with walls made of welders curtains. There were no overseas phone connections, email was non-existent, and mail was either sent out on planes or via MARSGRAM, which was a military version of a telegram.

I think that most employees of this program would agree that the friendships you make in this remote spot are one of the great rewards of working in this special place. I

met my wife at McMurdo in 1993, and we worked together at McMurdo, South Pole and Palmer. We wintered-over at McMurdo for three consecutive seasons and then moved to Palmer, where we did our fourth consecutive winter-over.

I've worked in the Peninsula area, supporting Palmer Station and research vessels, for the past 13 years, and I've been a fulltime employee working for three different contractors since 1998. This is a very unique program, and the dedication

of its support staff is unlike any other job with which I've ever been involved. There is something so special about Antarctica and the folks who have been to the Ice. It changes one's awareness of the environment and one's own values. Although the companies who are awarded the Antarctic contract change over time, one thing remains constant, and that is my commitment is to the US Antarctic Program. ¶

NOTE: As mentioned in the introduction we are closing out this series of articles, confident that most of our readers are already mindful of the paths they and their colleagues have tread to the Ice, perhaps countless times in their own careers.

Even so, the series hopefully freshened memories and also called attention to "the new kids on the block" and the fact that, yearly and worldwide, there are new institutions coming on line offering polar studies. Then, too, technological advances continue to overcome cold and dark and other impediments to fruitful scientific and commercial development in the polar regions. Jobs and career opportunities go hand-in-hand with these developments. — Editor ¶

Polar Treaties That Work (Part Two)

In the July 2014 issue of The Polar Times I introduced an article on "Polar Treaties That Work," with Part One in that issue being on the subject of the Antarctic Treaty of 1959 (ratified in 1961). The following is Part Two, regarding the Svalbard Treaty—a parallel polar treaty in the Arctic—which has some similarities to the Antarctic treaty, but also major differences.

Svalbard Treaty of 1920 (1925)

The Svalbard Treaty—also called Spitsbergen Treaty—is unique in providing agreement among several countries for the use of an archipelago that is part of Norwegian territory but open to signatories of the Treaty for science, fishing, hunting, mining exploration and commercial development. Spitsbergen (meaning "sharp-peaked mountains") is the largest island in the archipelago of Svalbard. The original Treaty of 1920 included 14 contracting parties, plus several additional parties who signed within the following five years before the treaty came into force. There are presently 42 parties to the treaty. International diplomacy recognized Norwegian sovereignty, including related principles:

Svalbard is part of Norway—the Treaty also includes Bear Island, to the south of the main archipelago.

Taxes collected will be used only enough to support Svalbard and the Svalbard government. This results in lower taxes than mainland Norway, with Svalbard's revenues and expenses separately budgeted from mainland Norway.

Norway must respect and preserve the Svalbard environment.

All nations and all companies of every nation under the treaty are allowed to become residents and to have access to Svalbard, including the right to fish, hunt or undertake any kind of maritime, industrial, mining, or trade activity. Residents of Svalbard must follow Norwegian law, although not all Norwegian law applies.

Naval bases and fortifications and also the use of Svalbard for war-like purposes are prohibited.

The 10 articles plus an annex of the Svalbard Treaty can be found at the fol-

lowing website: http://en.wikipedia.org/wiki/Svalbard_Treaty.

The principal local authority in Svalbard is the Governor (or Sysselmannen), who lives in Longyearbyen and has jurisdictional, police and administrative power throughout the archipelago. A visit to Bear Island (Bjørnøya) is possible by virtue of tour vessels that are authorized to stop there. In 2003 I visited the Norwegian meteorological station there which included a building with a shop that sold souvenirs for tourists. Visitors to Port Lockroy in Antarctica and

Similarities between the Antarctic Treaty and Svalbard Treaty pertain to steps taken to protect the environment and prohibition of a military presence except for support of allowed activities.

South Georgia can relate to that opportunity. A visit to Jan Mayen (71°N)—an island also under Norwegian sovereignty, and the northernmost active volcano in the world—is also possible and of interest to adventurers and those who keep tick lists of various geographical features. The island has a small number of occupants to service meteorological equipment, and is approachable by Zodiac on a beach.

Longyearbyen is a settlement with only 2,000 or so inhabitants, many of whom live there year-round. It gets its name from an American, John Munro Longyear, who was active in the coal-mining industry around what later became Longyear City, later Longyearbyen, during the years 1906-1916. Longyearbyen is on Adventfjorden, a

bay of Isfjorden on the west coast of Spitsbergen. Coal beds are common in that area of Svalbard, consisting of horizontal beds of coal that are relatively easily mined. Mining in the area around Longyearbyen exhausted the local deposits, and mining was then extended to more distant beds in the same fjord. The local company is called Store Norske Spitsbergen Kulkompani.

Mined coal is transported from the mine to a collection site at the local pier for transport to Norway, and is also used locally for heating purposes for the settlement of Longyearbyen. Mining of coal is not economical, but is conducted as a means of establishing Norway's sovereignty of the area. The same might be true of the nearby settlement of Barentsburg, operated by Russia since 1932, where coal mining has been conducted ever since by a population of about 500, mainly Russians and Ukrainians. Pyramiden, an earlier Russian mining settlement, has been abandoned.

Similarities between the Antarctic Treaty and Svalbard Treaty pertain to steps taken to protect the environment and prohibition of a military presence except for support of allowed activities. A visit to the main settlement, Longyearbyen, however, illustrates a major difference between it and McMurdo Station, Antarctica, for example, with McMurdo essentially absent of vegetation and



Sign at Longyearbyen airport, latitude 78°15'N.

Longyearbyen with a variety of grasses and flowering plants.

What is similar, though, between the two locations is in regard to latitude—77°51'S for McMurdo and 78°15'N for Longyearbyen. Due to a northern branch of the Gulf Stream, the ocean west of Svalbard is fairly productive and forms the biological basis of numerous large sea bird colonies on the west coast. Reindeer and polar fox are abundant, as are polar bears, especially in the eastern side of Svalbard. An estimate of some 3,000 polar bears occurs in the archipelago, with some of them in the vicinity of the populated area of Longyearbyen. Local requirements include carrying a rifle when residents travel outside the city limits of Longyearbyen. A local store portrays a

Local requirements include carrying a rifle when residents travel outside the city limits of Longyearbyen.

sign at the entrance to state that *"There are no living animals inside the store, only outside, so please leave guns outside."* There were no signs anywhere of the presence of NRA (National Rifle Association) affiliations or equivalent.

Due to the presence of vast colonies of sea birds on Svalbard, cats are not allowed because of their potential as predators of wildlife. Another prohibition for residents is that "dying" is not permitted (tongue in cheek), because the permafrost does not allow burial locally, and bodies must be shipped to Norway as a result. There is a cemetery dating to earlier years, but no longer in use as a cemetery.

Anyone choosing to live in Svalbard must be gainfully employed and able-bodied, for there is no crime here and no homeless people. This very special place, said Mayor Christin Kristoffersen, "has all the conveniences of a modern urban area, including an airport, high-speed internet and a high-end restaurant." All residents must have a fixed address, a rule that ensures that nobody freezes to death in a place that is closer to the North Pole than to the Norwegian capital, Oslo.

Svalbard has no restrictions on foreigners who want to move there, except that they must have a job. Because of the 1920 treaty, the territory is open to all nationals of the 42 nations that have signed the pact. A population that used to be homogeneously white now includes Thais, Chinese and many other nationals. There is essentially no crime here, perhaps related to the fact that

anyone who lives here must have a job. Minor infractions reported by the six-man police force include reckless driving by snowmobile, and shoplifting. The latter might be understandable, considering that a liter of milk can cost the equivalent of nearly \$7, while alcohol and cigarettes, free of many of the high taxes in the rest of Norway, are relatively cheap.

I was a guest of the mining company in the 1980s and visited what was known then as Mine Number 7, only a few kilometers from Longyearbyen. I was given the use of an automobile by one of the mining company employees and thus drove on most of the few roads in the fjord for sightseeing purposes. I also spent some time in the area of nesting auklets and

other seabirds, where large colonies occur in the cliffs on the other side of the airstrip. Newly hatched auklets were flying off the nests in hopes of a safe landing and a short distance to the shoreline, but occasionally failed to reach water and were quickly seized by Arctic fox that roamed the area below the cliffs. The archipelago is a flyway for a variety of birds, including swans that I noted on several days. About 20 to 25 bird species breed on Svalbard, with about 100 observed as non-breeders or irregular visitors. There are no rodents on Svalbard, therefore no birds of prey. Gulls have taken over that role, harvesting eggs and young in eiderduck and seabird colonies. The parallel to that in Antarctica is the kelp gull, the only gull species in Antarctica, where it feeds on limpets and also eggs and young of other birds. There are no rodents in Antarctica, either, or raptors, but skuas and giant petrels are part of the food chain, preying on penguins.

Recreation for residents is available in a variety of ways, including windsurfing in the frigid waters of the fjord, a cinema,

motor toboggan travel, camping (with firearms), and finding ways to deal with lengthy periods of darkness in winters.

Living and working on Svalbard has the benefit of lower taxes assessed than on mainland Norway, an attraction for those recruited for limited employment availability.

Because of the permafrost at these latitudes, construction of facilities requires buildings on stilts, with the active layer thawing in summer and resulting in boggy areas due to lack of efficient drainage.

In my first visit to Longyearbyen in 1979, I noticed a large number of tents adjacent to the air strip, and was informed that there were no provisions for hosting travelers with lodging or much of anything else, so visitors had to come prepared to fend for themselves. Times have changed, with several comfortable hotels, a general store for purchases of food and other items, and shops for outfitting excursions and tourists that arrive during much of the summer, either on tour ships or by aircraft from Norway.

In 1988 I stayed in lodging for visitors authorized for consultation with employees of the coal mining company, and in later years stayed at comfortable hotels with excellent restaurants and services. Much of the reason for the increase of facilities pertains to Svalbard as a popular destination for tourism, with numerous tour vessels stopping at Longyearbyen for short stays and changeovers for passengers in the summer months. Daily flights from Oslo and Tromsø make the industry practical and affordable. Tromsø is about 600 miles (nearly 1,000 km) from Longyearbyen. After arrival at Longyearbyen, visitors will soon receive a booklet on "Environmental Regulations for Svalbard," emphasizing the importance



Windsurfing in Adventfjorden at Longyearbyen.



Reindeer at Longyearbyen

of observing requirements for travel, camping, and hunting. Bird sanctuaries and wildlife refuges are identified, as are cultural features and monuments. Hunting seasons are specified for Arctic fox, seals, and numerous bird species. Reindeer are commonly seen in Longyearbyen and the area around it.

An interesting parallel to the transportation and lodging information might also be applied to visits to selected stations in Antarctica, where flights from Australia to an Australian station might be feasible for tourists if appropriate infrastructure occurred on the continent and local services were available for entertainment or outdoor activities, such as overland travel by motor toboggans, camping, and so on. Discussions I am aware of at past Antarctic Treaty Consultative Meetings have not been favorable to the concept, although in some respects the activity would help to pay for expenses related to national programs.

Tourism in Antarctica is managed by the International Association of Antarctica Tour Operators (IAATO), discussed above in the paragraphs on the Antarctic Treaty. It is noted by Treaty Parties as a successful management tool for its purpose, and it also has a parallel organization in the Arctic—the Association of Arctic Expedition Cruise Operators (AECO), founded in 2003 and following many of the same environmental guidelines as IAATO formulated for Antarctica. Latitudinally, it also covers an equivalent area as the Antarctic Treaty does (south of 60°S, vs. 60°N for AECO), with core areas specified as Svalbard, Jan Mayen, Greenland, Arctic Canada, and the national park “Russian Arctic.” Head office for AECO is

at Longyearbyen (see <http://www.aeco.no/>).

Efforts by AECO to launch a “Clean Up Svalbard Project” by the Governor was proposed for funding by the Svalbard Environmental Protection Fund, but failed (AECO announcement December 4, 2014) for lack of funding. The project would have involved beach clean-up by tour operators and others to collect sea-transported garbage as a means of reducing danger to wildlife as well as for esthetic reasons. In my travel around Svalbard on tour ships, all staff and passengers were engaged in clean-up on beaches landed, transporting the trash to Longyearbyen for disposal.

A stroll around Longyearbyen is worthwhile if you need anything you forgot to bring, for most anything is available in a variety of shops. An excellent museum contains considerable artifacts about polar expeditions, including attempts to reach the North Pole from a station north of Longyearbyen, Ny Ålesund, a small Norwegian settlement that has a history of a base for several attempts to reach the Pole, some of them successful. It is also useful as a research center, with scientists from as many as 15 countries occupying it in summer. Also in the Longyearbyen vicinity is the Svalbard Global Seed Vault, a storage place for samples of the world’s seed crops as a means of preserving them forever in a frozen condition. Last but not least, the Svalbard University Centre is a place for higher education and research. For a settlement of only about 2,000, Longyearbyen has much to offer for a visit or extended stay. ¶ *Content includes excerpts from The New York Times, 9 July 2014, by Andrew Higgins.*

Mysterious Penguin Disease Spreads to Antarctica

www.sciencemag.org, 18 August 2014, by Jennifer Balmer—Although penguins can’t fly, they still need feathers. Without them, the birds risk succumbing to rain, cold, disease, and even death—which is why researchers are concerned about the recent reappearance of a rare disorder causing the feathers of young penguins to fall out.



Photo by Annette Barlow

The so-called feather-loss disorder was first seen in 2006 in penguin chicks housed at a captive facility in South Africa. One year later, several cases were observed across the Atlantic Ocean, in wild Magellanic penguin chicks along the coast of Argentina. Now, seven years after the last outbreak, feather-loss disorder has mysteriously re-emerged, this time in penguins on the Antarctic Peninsula, researchers report in *Antarctic Science*. In January, they spotted two chicks in the Hope Bay Adélie penguin colony that were missing large patches of feathers. One chick was later found dead, and the other went missing and is presumed to have perished. The fact that no other cases were observed in the colony of 14,000 penguins suggests that feather-loss disorder is not easily transmitted between individuals. Still, the cause of the disease and how it spreads remain mysteries scientists are now racing to solve. ¶

Polar Diplomacy

by Ray Arnaudo, from Washington, D.C.

Since I last wrote, the State Department has strengthened its polar team by naming retired Coast Guard Commandant Robert Papp to the newly created position of the Special Arctic Representative. He will report to the Secretary through the Under Secretary for Economic Growth, Energy and the Environment and will be responsible for coordinating U.S. actions in the Arctic. At the other pole, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) held its 33rd annual meeting in Hobart, Tasmania, October 20-31. Toothfish (Chilean sea bass) catches declined by over 20 percent from last year, but the krill catch was the biggest since 1991.

Arctic

Arctic countries are into the final year of Canada's chairmanship of the Arctic Council. Senior Arctic Officials (SAO) met in Yellowknife, Canada for their third meeting under Canadian leadership of Leona Aglukkaq, October 21-23. Canada presented the game plan for the Ministerial that it will host April 24-25 in Iqaluit, capital of Nunavut, and the site of the first Arctic Council ministerial in 1998. Iqaluit is a small town of less than 7,000 people, so facilities may well be stretched. The meeting will gather Ministerial-led delegations from the Arctic Eight and a number of observers to the Council, which have grown to 32 countries and organizations. The Council meeting will also expect to act on the recommendations of three task forces, the main operational arm of the forum. Canada will also host what it is calling a "showcase meeting" in Ottawa the day before, on April 23, to highlight the work of the council at a more convenient venue.

Canada's main initiative has been the creation of the Arctic Economic Council, which was the result of the Circumpolar Business Forum Task Force, dedicated to the economic development of the Arctic. Participants in the AEC are members of countries' business community and work on issues such as energy, mining, tourism, and fisheries.

Three task forces will also present reports

on their efforts. The Task Force on Black Carbon and Methane is focusing on emissions monitoring and reduction, and reporting and observing arrangements, and could lead to a legally binding agreement. The Scientific Cooperation Task Force is looking into the removal of logistical and administrative barriers to research cooperation; its discussion will probably continue into the US Chairmanship in 2015. At this writing, there seems to be agreement to codify this cooperation into a binding agreement. Lastly, the Task Force on Arctic Marine Oil Pollution is working on an action plan to further cooperation on the prevention of oil spills. It is not clear whether this will lead to a third Arctic Council binding agreement.

Canada is also overseeing several other items. One is the review of a €5 million (US \$6.2 million) Russian government grant to the Nordic Environment Finance Corporation, which intends to finance Arctic Council projects. Another is the consideration of pending observer applications. There are about a dozen organizations awaiting consideration, in addition to the European Union, whose membership has been blocked by Canada and Russia, although Canada has apparently resolved its dispute over seal product imports. The matter will be considered again at Iqaluit.

The U.S. will assume the chairmanship of the council in 2015-2017 and took the occasion of this SAO meeting to present its goals for its two-year stint. The three main goals with specific projects are:

- 1) **Arctic Ocean stewardship**
 - Search and rescue
 - Marine protected areas
 - Regional seas
- 2) **Addressing climate change**
 - Black carbon
 - Adaptation problems for Arctic communities
- 3) **Improving economic and living conditions**
 - Renewable energy
 - Water and sanitation
 - Telecommunications
 - Mental health and suicide prevention

All agree this is a very ambitious program, but Arctic partner countries are encouraged by the proposals.

As mentioned in the summary, the U.S. announced the appointment of a new Special Arctic Representative for the State De-

partment, retired Coast Guard Commandant Robert Papp, who will have oversight of State's efforts in the North. His precise remit is still a bit of a work in progress, but he assumes the new role of the U.S. government's highest responsible official for Arctic matters, reporting though the Under Secretary of State for Economic, Environment and Energy Affairs. At the same time, Alaskan Fran Ulmer was named as Special Advisor to the Secretary of State on Arctic Science and Policy. Ulmer will continue to serve as chair of the U.S. Arctic Research Commission (USARC). Julie Gourley remains the U.S. Senior Arctic Official, and Amb. Dave Balton will probably take the role of chair of the council when the U.S. takes over from Canada next April. Next SAO meeting: March 3-5, 2015, in Whitehorse, Yukon Territory.

Antarctica

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) held its 33rd meeting in Hobart, Australia, October 20-31, 2014. Twenty-four of the total 25 commission members were present; only India was not represented. The U.S. usually takes a delegation of about a dozen, including reps from the State Department, NOAA, and the National Science Foundation, as well as industry and environmental groups.

The big issue of the meeting was the attempt to approve two marine protected areas. The first and largest was a proposal, first suggested in 2010, to set aside a large portion of the Ross Sea and was led by the efforts of the U.S. and New Zealand. Despite strong support for the proposal by the vast majority of countries, Russia blocked the proposal again, for the fourth year in a row, while Ukraine, which had previously aligned with Russia, changed position and was willing to go along with the MPA subject to final negotiations. But to the dismay of many, China, which had previously expressed positive views to us about the Ross Sea proposal, reversed its position and made strong arguments in support of blocking the MPA, many in support of Russian opposition—this, despite China having worked productively with us and New Zealand over the past two years, including agreeing to positive statements of cooperation on the Ross Sea MPA in the other bilateral discussions with the U.S.

The commission also discussed another

MPA proposal submitted by Australia, the EU, and France for the establishment of a network of MPAs in East Antarctica. Like the Ross Sea proposal, this was the fourth time this set-aside has been presented. Many modifications were offered, and previous opponents, such as Norway, had agreed, but Russia and China blocked consensus on this proposal as well.

The U.S. co-sponsored a measure with Brazil, Chile and the European Union, to discourage the practice of shark finning (i.e., removal of the fins and discard of the carcass at sea) in the commission area, which received support from a large number of members, but in the end, it was not adopted. Japan and China blocked the proposal, claiming they did not believe such a measure was necessary because directed fishing on sharks was already prohibited and the shark bycatch within the Convention Area is small.

In the 2013-14 fishing season, thirteen countries fished for toothfish, perhaps better known as Chilean seabass (*Dissostichus eleginoides* and/or *D. mawsoni*), reporting a total catch of 11,590 tons, which was down from 15,330 tons last year. Five countries (Norway, China, Poland, Korea, and Ukraine) fished for krill in the 2013-14 fishing season and reported a total catch of almost 300,000 tons, the highest catch since 1991. Most of this catch was taken from around the Antarctic Peninsula and South Shetland Islands

and around the South Orkney Islands and South Georgia (Subarea 48.3). The same five countries plus Chile expressed plans for a total of 21 vessels to fish in the krill fishery next year. There was a proposal to increase observer coverage in the krill fishery to 100 percent of the fishing vessels, from the current level of 50 percent, but China blocked the proposal.

In a climate related matter, the Committee for Environmental Protection of the Antarctic Treaty Consultative Meeting and the Scientific Committee of CCAMLR agreed to hold a joint workshop on ecosystem and environmental monitoring to detect the effects of climate change. The workshop is expected to be held in 2016.

The commission also agreed to host two review conferences in the future. Chile, Australia and the United States offered to hold a CCAMLR symposium to mark the 35th anniversary of the adoption of the CAMLR Convention, and it was also agreed to initiate the second CCAMLR Performance review, the first having been conducted in 2008.

In case you wonder about costs of these international organizations, CCAMLR's budget for 2014 was approved at AU\$4,654,000 (US \$4 million). The U.S. share was about US\$109,000. Russia will assume the chair next year, in the normal alphabetical rotation of the leadership position, for the next two years. Next year's meeting will be held

October 19-30, 2015, at the commission's headquarters in Hobart, Australia.

In other Antarctic news, the National Science Foundation Program has decided to begin planning for the remodeling and upgrading of its stations at McMurdo, which dates to the 1950s, and Palmer, constructed in the 1960s. NSF will now begin discussing budgets and plans with the National Science Board.

China and Australia signed a Memorandum of Understanding on November 18, promoting cooperation in Antarctica. The MOU commits China to use Tasmania as its main port of debarkation, and the two countries pledge increased commitments to cooperation.

Finally, President Nazarbayev of Kazakhstan announced his country's intent to accede to the Antarctic Treaty. If successful, Kazakhstan would be the first country in Central Asia to become a party to the treaty. Four former Soviet states are signatories to the treaty: the Russian Federation and Ukraine are Consultative Parties, and Belarus and Estonia are Non-Consultative Parties. The next Antarctic Treaty Consultative Party meeting (ATCM XXXVIII) is scheduled for Sofia, Bulgaria, June 1-10, 2015. ¶ *Ray Arnaudo, a retired State Department official, led U.S. polar diplomacy efforts for many years, and writes the occasional column on international activities in the polar regions. (rarnaudo@gmail.com)*

Frederik Paulsen's Vision for South Georgia Island

Businessman-Explorer-Philanthropist Eyes a New Antarctic Science Preserve

by Sheldon Bart

Frederik Paulsen, chairman of the board of the Swiss biotech giant Ferring Pharmaceuticals, an explorer, and a philanthropist who has donated millions to eradicate an invasive species—rats—that upset the ecosystem of South Georgia Island, has a new vision for one of the former Antarctic whaling stations.

Inspired by what the Norwegians accomplished in the old, abandoned mining town of Ny Ålesund (Kings Bay), Svalbard, Paulsen is seeking to transform one of South Georgia's crumbling whaling settlements into an international science preserve. Today, some 10 countries operate research facilities at Ny Ålesund under the supervision of the Norwegian Polar Institute.

South Georgia—the island Sir Ernest

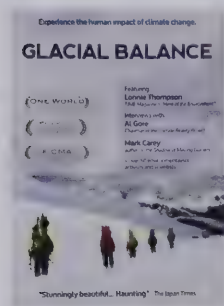
Shackleton aimed for on his open-boat voyage and famously crossed seeking help for the marooned survivors of the Endurance expedition—was then the site of factories built by whaling companies for the processing of their catch. The whaling stations are falling into ruin, but Paulsen proposes to follow what the Norwegians did at Ny Ålesund and turn one of the old whaling stations into an international scientific station.

Paulsen was instrumental in establishing the South Georgia Heritage Trust (SGHT) in 2005. This is an organization whose signal achievement has been combating an increasing rodent population that devastated the island's natural habitat. Rats arrived with the whalers and sealers and lived off the eggs and chicks of

the birds that thrived on the island. As a result, storm petrels and other avian species were affected in their regular breeding cycles, reducing the populations of the numerous ground-nesting birds. Through Paulsen's devotion to this cause as a trustee and donor, many birds have returned.

A science station on South Georgia Island would provide a handy observatory for zoologists and naturalists interested in furthering these studies. (This article is excerpted from a telephone interview between Bart and Frederik Paulsen on 9 November 2014.) ¶ *Sheldon Bart's most recent book is Race to the Top of the World: Richard Byrd and the First Flight to the North Pole (Regnery History, 2013).*

Film Review



Glacial Balance

Film, directed, produced and
photographed by Ethan Steinman
Daltonic Films, 2013
\$259.99 (Universities)
\$75.99 (K-12)

Reviewed by John Spletstoesser

Mountain glaciers provide the theme of this film by documenting retreat of selected glaciers in the Andes Mountains, with commentary and interviews by a scientist-investigator and world-renowned glaciologist Dr. Lonnie Thompson, Distinguished Professor at The Ohio State University; former U.S. Vice President Al Gore; and Mark Carey, Professor of History at the University of Oregon. The geographic span of the Andean glaciers is from Colombia to Argentina, with the purpose of the film to emphasize the impact of climate change on glaciers and how that affects people and ecosystems from the summits of mountains to the bottoms of valleys.

There are two discs for viewing, each one taking just over one hour and a half, consisting of the interviews mentioned plus those of local inhabitants of the six countries involved. An interview by Lonnie Thompson, taking nearly 23 minutes, provides an excellent introduction to the subject of glaciology, ice-coring for studies of paleoclimate, and predictions of the demise of specific glaciers from his 55 expeditions to 16 countries over a period of 35 years. Glaciers on Mt. Kilimanjaro, for example, are predicted to be gone in 20 years. He is interviewed in the field, in Peru, where he replies to questions off camera, with a setting of a glacier in the surroundings at 5,400 meters. Wearing a parka and warm headgear, he is in what could be called his field laboratory, where he said the deepest hole in the Andes glaciers was achieved at 195 meters to bedrock.

After a short description of a glacier (ice in motion), he mentions the longest time record for the ice retrieved from glaciers and their impurities is about 800,000 years. An ideal setting for ice-core drilling is a glacier that has a flat bottom, no crevasses, and no melting, which means higher elevations are the best. A main objective of his studies is to salvage cores before they disappear, thus destroying their value in paleoclimate research.

Drilling produces an 11-cm-diameter core that can include radioactive fallout from bomb tests, dust, pollen, insects, and plants, for example. The cores are eventually brought to Columbus, Ohio, and stored in freezers, which presently contain 7,000 meters of ice at -30°C. His career with glaciers started when he

was a student at The Ohio State University and received a grant of \$7,000 to organize an expedition to a little-known glacier in Peru in 1974, the Quelccaya, the largest tropical ice cap in the world.

Ice cores studied from the glacier showed evidence of various periods of El Niño activity, such as plants and wetlands dating back to 5,200 years ago, as determined from radiocarbon-dating of more than 60 plant varieties. Al Gore's interview (18) minutes emphasized the importance of an experienced and dedicated investigator like Lonnie Thompson in the study of climate and his ability to transfer his knowledge to the public and others involved in climate studies. Gore pointed out the importance of water in glacierized areas like the Andes for purposes of agriculture and drinking, for example. Prof. Mark Carey's interest as an historian spans a number of years studying the environmental history in Latin America, especially in glacier areas in the Peruvian Andes, such as the Cordillera Blanca. The importance of glaciers in this history pertains to glacier lakes that have become dammed, flooding episodes and lake outbursts.

Interviews with local inhabitants of Andean sites include farmers who operate a variety of crops, each connected with the relation of nearby retreating glaciers and water supply from melting related to a warming climate. Interviews of individuals ranging from farmers to city and government officials in each of the Andean countries are nearly all in Spanish, with English subtitles. Local conditions range from drought areas in desperate need of water to areas with abundant rain and meltwater from existing glaciers. Commentary by Thompson and Carey accompany the interviews of the local individuals to emphasize aspects of glacial retreat and dwindling supplies of meltwater.

A highlight of the film shows a field team actively drilling in a glacier in Peru to show what is involved with the equipment and recovery of an ice core, where the core is inspected quickly, put into a core tube and stored in a chamber dug into the glacier to protect it from melting. The second part of the exercise is shown with field members backpacking the core tubes off the glacier to be sent eventually to Columbus, Ohio, and stored in a freezer.

Scenes of agricultural activity involve harvest of coffee beans in Colombia, potato farming in Ecuador, quinoa and beans in Ecuador (beans require less water), fruit farming in Chile (mainly for an American market), and harvest of grapes near Mendoza, Argentina, where drip irrigation is used for vineyards. Viewers will be treated to a close-up view of Perito Moreno Glacier in Argentina, where a group of tourists with a guide visit the spectacular site and walk on the surface.

The overriding theme of 'Glacial Balance' is evident in the repetition of glacier retreat and resulting meltwater that is critical for human consumption and farming in the upper and lower elevations of the adjacent land areas.

A final interview is conducted with Lonnie Thompson in the core-storage freezer at The Ohio State University, where he explains what is done with the analysis of each core and what is revealed in each to show the Carbon-14 age of the plant parts incorporated in the ice (from snowfall and windblown conditions), radioactive horizons, pollen, terrestrial dust, and entrapped gases like carbon dioxide.

Spectacular scenery of Andean mountains and glaciers is a major attraction of the film. Audiences for the film include age groups from elementary to university levels for courses dealing

with issues related to climate change, with evidence pictured in the film from numerous site visits and interviews at selected locations in the entire length of the Andes Mountains. Each disc contains a menu of its contents, so viewers can click on any of the topics and interviews in what might work best for school classes, in which teachers might provide additional material to explain what the content means. In this way, the entire content of Glacial Balance can be viewed over several class periods. I recommend the film for educational purposes in a variety of settings and venues as a means of illustrating one part of the world that is experiencing retreating glaciers and the crucial need for the meltwater that results, in a culture that depends on continuing production of crops as a livelihood. It is important in this regard for Dr. Lonnie Thompson, a world expert on the subject, to provide the commentary that is not only factual but understandable to any audience, a necessary factor in dispelling the interpretations often seen in the media by uninformed sources.

[Note cost reduction available for APS members: \$220.99 when ordered online with discount code APS14PR, on edu.passionriver.com/glacial-balance.]

[Note by reviewer: San Rafael Glacier, Northern Patagonian Ice Field, is a tidewater glacier nearest the equator at 46°42'S, and Skua, or Amalia Glacier, Southern Patagonian Ice Field, at 51°S, are two popular areas in the Chilean fjords area of the country visited on tour ship itineraries by both small and large ships, that offer a close-up view of retreating glaciers.]

Book Reviews



Blazing Ice: Pioneering the Twenty-First Century's Road to the South Pole

by John H. Wright
(Foreword by David M. Bresnahan)
Potomac Books, 2012, 295 pp., \$29.95

Reviewed by John Spletstoesser

There are a number of success stories in the history of the United States involvement in Antarctic research and logistics, and this is certainly one of them worth telling. A short bit of history is to remind readers that Antarctica was dedicated for science by Antarctic Treaty Parties in 1959, and the corollary to that is for logistics and available operational procedures

be available for research objectives to be realized. *Blazing Ice* is a valuable account of how the U.S. Antarctic Program (USAP) adapted to a modern and workable system to satisfy several objectives as a result of realizing that a major element of USAP logistics could be achieved by finding a better way to support the U.S. program at the Amundsen-Scott South Pole Station, thus reducing the need for numerous fueling flights by the program's workhorse, LC-130 ski-equipped aircraft.

The foresight of David Bresnahan, an experienced employee of the U.S. Antarctic Program's Office of Antarctic Programs, realized that an obvious solution to the issue was to construct a land-based route from McMurdo Station to the South Pole, increasing the one-way distance from 850 miles to 1,000, but more important, delivering fuel and cargo on a regular summer schedule that would be little affected by weather that might prohibit aircraft flights, and to also transport large quantities of fuel that would provide more aircraft time for deep-field and other project support. Something like 40 flights could be saved in the process and also reduce the carbon footprint related to aircraft flights.

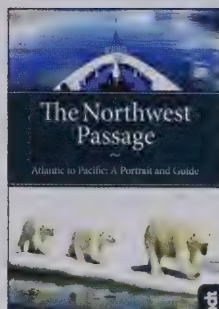
The proposal by Bresnahan was not endorsed in its early days of consideration, but the comparison of flights (and fuel) saved in the process, combined with the advent of technological advances such as GPS for navigation, ground-penetrating radar for finding hidden crevasses, Iridium phones for communication, and satellite imagery, were factors in authorizing approval.

Beginning in the 2002-03 austral summer and completing the road in the 2005-06 summer, on a route from McMurdo across parts of the Ross Ice Shelf that were previously unexplored, with the route from the shelf up the Leverett Glacier to the Pole, made the Ice Road a regularly used transport system. Seasonal progress is shown in figures in the text, along with other photos of the traverse equipment and traverse personnel. Annual grooming and crevasse maintenance has provided the means for its success and, for the first time since Amundsen's achievement of the Pole in 1911-12, round-trip summer travel to Pole and return became routine. Scott's party achieved the South Pole in January 1912 but failed to return due to weather and other factors. By coincidence, the tent in which Scott, Wilson and Bowers ended their journey lies at about the station labeled as SOUTH on the route figures for the Ice Road. R.K. Headland, historian and archivist at the Scott Polar Research Institute, has calculated that the tent, originally at about 79.6°S, 170°E, on discovery by a search party in November 1912, has moved 37 miles northward and is buried under 53 feet of ice (*Polar Record*, July 2011).

The word "Pioneering" in the subtitle of the book is meaningful, for there are few pioneering feats remaining in Antarctica. The Ice Road was certainly one of them but could not have been achieved without the foresight of Bresnahan and the employment of a seasoned individual like author John Wright to carry it through to completion. The text is a record of conversations and comments between Bresnahan, Wright, the traverse party, and others, in manners of speaking that ranges from casual to "earthy." This book will appeal to anyone with Antarctic experience as well as to a general audience, the key attraction being that of adventure and of an example of the concept of an idea that evolved into a major success through hard work and extensive planning.

It is worth mentioning that the Antarctic Treaty Parties soon commented on the Ice Road in its planning stages when discussed at Consultative Meetings, voicing concern about the Ice

Road being used for tourism travel to the South Pole. Because the United States does not "own" the road, it presented as a prospect for adventure tourism, but this has not occurred to my knowledge. ¶



The Northwest Passage Atlantic to Pacific: A Portrait and Guide

by Tony Soper
Bradt Travel Guides Ltd, UK, and
The Globe Pequot Press Inc., USA,
2012, 154 pp, £14.99; \$23.99

Reviewed by John Splettstoesser

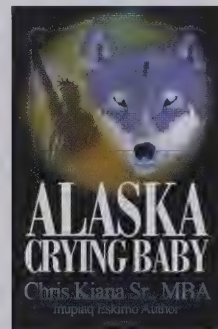
The author has spent many seasons in both polar regions as expedition leader and wildlife lecturer. He has circumnavigated the Arctic coast by both the Northeast and Northwest Passages, and also reached the Geographic North Pole by Russian icebreaker. His vast experience is shown in this book on the Northwest Passage through the waterways of Arctic Canada. Following a short introduction to the book, an historical timeline (p. 5-42) covers the exploration of this part of the Arctic, listing expeditions and explorers, many who failed, and some successes. Perhaps the most widely known attempt in this period is that of Sir John Franklin who, with his two ships *Erebus* and *Terror*, in 1845-46, had the misfortune of encountering ice conditions that prevented his passage beyond a small section of the complete passage. All 129 hands were lost, along with both ships, with details of their situation unknown for many years. After much searching, *Erebus* was discovered in 2014 in Victoria Strait near King William Island.

Polar explorer and veteran Roald Amundsen, the Norwegian who was the first to the South Pole, also was the first to transit the Northwest Passage, 1903-06, by wintering along the way. Two main sections follow the historical information: (1) The Passage Today; and (2) Transits of the Northwest Passage to 2011.

The first section (p. 43-140) has 5 chapters that describe the major routes that are normally taken by a variety of vessels from the start of the passage from east to west (hence the subtitle). The author has included numerous photos (most of them in color) of wildlife seen along those routes, including bird life and marine mammals (whales, seals) and polar bears.

The final section is by Robert Headland, with a list of transits of the Northwest Passage to 2011. Headland has compiled transits for many years and has brought it up to date (end of 2014) in a list that is now available in the website of the American Polar Society. (See article in this issue by Headland and Splettstoesser for

details.) A reference list of published sources is on p. 150, and a list of 6 expedition operators that Soper has traveled with is on p. 151, along with Acknowledgements. A two-page index provides leads to topics throughout the book. Anyone planning on booking passage on a cruise through the Northwest Passage, whether east to west or vice versa, will find this book a perfect manual for information on its history and wildlife. Several maps help to provide information on geography mentioned in the text. Anyone who has already transited the passage will find the book an excellent supplement to a personal journal or diary, and probably inviting the traveler to a repeated cruise. ¶



Alaska Crying Baby

by Chris Kiana Sr. (Inupiaq Eskimo)
Writers Club Press
(an imprint of iUniverse.com, Inc.)
Pub. 2000, 280 pp.
\$12.43 paperback (Amazon)
ISBN 978-0595096145

Reviewed by Cliff Bekkedahl

There aren't all that many opportunities to find novels set in the Polar Regions that are worthy of review in our pages, but here is a good one.

This is an Alaska shaman thriller. It starts way up north and works its way, tragically, southeast to New York City, where the central character, an Inuit medicine man, works his magic to achieve retribution for a senseless and vicious crime against a member of his close-knit family.

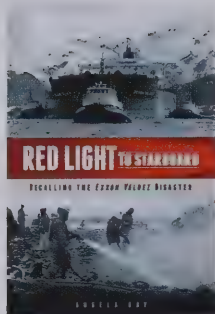
Author Chris Kiana (see pages 9-11 of this edition of *The Polar Times*) is careful to advise readers that he is not a shaman and that many of the rituals presented in this tale are based not on fact but on his understanding and interpretations of Eskimo myths that he learned as a child.

Our hero turns out to be the consummate tourist, and when he is not summoning the northern lights and the evil and terrifying Alaska Crying Baby to mete justice, he walks the Big Apple, meets a lady and shoots some high-stakes pool—all of which are facilitated by some special medicine in his leather pouch.

When I finished the book, I said to myself, "Movie!" The story has all the elements of an action movie.

Sure enough, when I mentioned my reaction to Chris, he said that he had been approached, and money had been put up for development; but another film project got the nod. Late word from Chris is that another film investor group is showing interest.

So, hey, if you're looking for a good read on your next flight or by the fire some cold winter night, get a copy. Amazon will get it to you in a couple days. (See <https://www.youtube.com/watch?v=phTcnLLg-8g> for a short video presentation.)¶



Red Light to Starboard: Recalling the Exxon Valdez Disaster

By Angela Day
Pullman WA: Washington State University Press
2014, xii + 266 pp., \$19.95

Reviewed by Dave Norton

Alaskans and Arctophiles elsewhere observed two anniversaries of life-changing disasters, three days apart in 2014. The 25th anniversary of the night that the supertanker *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound, causing the escape into the coastal marine environment of what was then the largest oil spill in U.S. history (estimated at 11 million gallons or 42 million litres of Arctic crude) was March 24. Then, March 27 marked the 50th anniversary of the moment that rocks snagging pieces of Earth's crust fractured 20 km beneath the surface of Unakwik Inlet in Prince William Sound. That fracture released strain pent-up along edges of two sections of Earth's crustal plates, one diving beneath the other. A cascade of subsequent fractures and lurches produced the Magnitude 9.2 Great Alaska Earthquake, the largest ever recorded on modern instruments in North America.

Published just weeks before the 25th anniversary of the oil spill, Angela Day's book achieves a synthesis at the convergence of several themes and experiences. On one hand, in scholarly tradition, she carefully documents countless relaxations in caution and vigilance, and numerous alarms raised but ignored about cost-cutting measures that cumulatively added to industry's and governments' complacency about dealing with risks. The relaxations and ignored alarms began perhaps 16 years before the spill itself. That was when the U.S. Congress authorized the Trans-Alaska [oil] Pipeline System by a single vote in 1973 (p. 77-78). During 12 years of nearly flawless operations of pipeline and tanker oil transport, institutional provisions safeguarding against accidents in the coastal ecosystems of Prince William Sound further relaxed. Complacency inevitably magnified the accident into a full catastrophe when it happened. The accident was followed by ineffective efforts to clean up what Alaska's Governor, Steve Cowper, at first sight couldn't resist calling a "goddamned mess" (p. 20). The glacial pace of tortuous legal proceedings that reduced compensatory and punitive damages awarded to Prince William Sound fishermen stretched their suffering and disenfranchisement to—and in many cases beyond—tolerance.

On the other hand, *Red Light to Starboard* does not afflict readers with dehydrated scholarship. The author relates personal stories of people who have dealt variously with both immediate and prolonged consequences of the tragedy. Her narrative

achieves the level of read-aloud vitality that compelled this reviewer to share a number of passages with colleagues or family within earshot, after getting their attention, "Hey, you gotta hear this..." One such read-aloud passage is the author's account of a plucky young Valdez resident driving a dump truck after the 1964 Earthquake that devastated the original Valdez town site and killed 33 people in Port Valdez. He cheerfully strapped himself into the truck's cab, years before wearing vehicular seatbelts was routine or mandatory. Massive irregular-shaped boulders that he was hauling to build the breakwater at the new Valdez town site would occasionally shift, and flip his truck as he maneuvered them into place. Unfazed, he would hang in harness until the crane operator, standing by for just such mishaps, came over to set truck and driver upright again to resume hauling (p. 91).

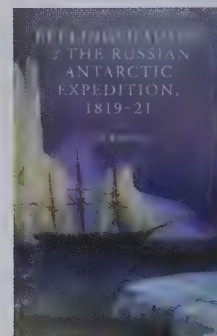
Valdez citizens energetically relocated their town to more stable ground within 3 years of the destructive earthquake and tsunami of 1964. By then, thousands of pages of field data, maps, photographs and geological interpretations of Alaska's "Great" earthquake had been published by government agencies such as the U.S. Geological Survey. But John Nance's *On Shaky Ground*, the definitive popular account of public take-home lessons comparing the Alaska Earthquake with seismic events elsewhere, did not appear until 1988, just months before the 25th anniversary of the Alaska Earthquake. That was about when geophysical wisdom had ripened to the point that it could be translated into guidelines and "alerts" for national and local public policies relating to earthquake threats.

By analogy with Nance's book, I doubt that anybody could have written *Red Light to Starboard* much before the spill's 25th anniversary. The passage of nearly a human generation of time has allowed the devastating short-term effects of the spill to be understood in a wider context. The extent of ecological and human recovery from the horror to which people awoke on Good Friday morning in 1989 could be defined and articulated better with the passage of time. Many of the spill's observers, participants and victims took years to realize that sharing their experiences might help others cope and heal from this misfortune, or from other catastrophes. In that sense, Angela Day makes the *Exxon Valdez* disaster into a metaphor, by enabling its lessons to 'carry across' time, and 'carry across' distinctions among different types of upheavals.

Day contrasts the experience of the 1964 Earthquake and the 1989 oil spill in Prince William Sound. The natural disaster in 1964 unified communities in determination to overcome loss of human life and property (p. 92). By comparison, the human-precipitated disaster of 1989 divided communities into factions that blamed other factions for agonies that included damage to community resources, if not immediate human mortality.

The Deepwater Horizon oil spill of 2010 in the Gulf of Mexico reminds us that institutional complacency recurs, and that we continue to abuse Earth's oceanic environments at our peril. In August 2014, a field researcher from a prestigious Midwestern university was in Fairbanks preparing for her first trip into the Alaskan Arctic by road and chartered aircraft. At one point she asked me, "What's this pipeline people tell me I will be seeing alongside the highway?" Her unawareness of the geography and history of Arctic petroleum led to my discovery that at the time of the *Exxon Valdez* disaster, she was a second-grader. Reciprocal insularities among Arctophiles and Midwesterners, or those divid-

ing 60-somethings from 30-somethings, underscore the need for 'metaphoric' books like *Red Light to Starboard*. ¶

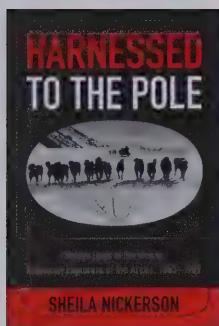


Bellingshausen & the Russian Antarctic Expedition, 1819-21

by Rip Bulkeley. NY: Palgrave Macmillan, 2014
(\$95.00) 280 pages ISBN 978-0-230-36326-7

Reviewed by Charles H. Lagerbom

There have never been many works dedicated solely to the Fabian Gottlieb von Bellingshausen expedition to Antarctica in 1819-1821. Bellingshausen's own account was not translated from Russian and made available to English readers until Frank Debenham edited a two-volume set produced by the Hakluyt Society in 1945. It was the first Hakluyt Society publication after World War II, only 500 copies were printed, and copies in decent condition have been quite scarce ever since. Bellingshausen's voyage has since then been covered, usually only briefly in other general accounts of Antarctic exploration. No one in the last fifty-plus years has done it the justice that it rightly deserves. Rip Bulkeley has changed all that with his new book *Bellingshausen & the Russian Antarctic Expedition, 1819-21* published by Palgrave Macmillan. In a very thorough and scholarly approach, Bulkeley delivers a complete treatment of the Russian Bellingshausen and his voyage and findings. The book has many nice features. Helpful and informative figures, maps, tables and sources are supported by a detailed chronology of Bellingshausen's life and significant contemporaneous European events. The book is divided into three parts, the first entitled the Imperial Quest, followed by Reports and ends with Findings. The reports, memoranda and personal letters make for fascinating reading including the personal journals and diaries of expedition astronomer I.M. Simonov and Able Seaman Yegor Kisilev. In six appendices, Bulkeley provides further information about the expedition with crew lists, deaths, sizes of the ships, measurements and money as well as an ice vocabulary. An exhaustive twenty-page bibliography is accompanied by detailed notes, a helpful glossary and a meticulous index. In the early 19th century, the Russians sent one of the first major expeditions to Antarctic waters and Rip Bulkeley's *Bellingshausen & the Russian Antarctic Expedition, 1819-21* has capably brought that nearly two hundred year old voyage back to forefront of our attention. ¶



Harnessed to the Pole: Sledge Dogs in Service to American Explorers of the Arctic, 1853-1909

by Sheila Nickerson

Fairbanks: University of Alaska Press, 2014

(Paperback \$24.95)

ISBN 978-1-60223-223-5

Reviewed by Charles H. Lagerbom

As the old adage goes, every dog has its day. In Sheila Nickerson's book *Harnessed to the Pole: Sledge Dogs in Service to American Explorers of the Arctic, 1853-1909* not only do polar dogs get their day, many also star prominently in their own chapters. From early uses of dogs by Rae and McClintock in searching for Sir John Franklin, Nickerson thoroughly and competently tells the story of how these animals became integral members of many different Arctic expeditions. Kane's Toodla and Whitey, Hayes' Oosisoak and Arkadik, and Hall's Barbekark, Wolf, Smarty, Bear, Shoemaker and Tiger all get their stories recounted. We learn about Schwatka's Toekelegeto, Ublubliak and Miqijuk, DeLong's Kasmatka, Snoozer, Bingo, Tom, Jack and Wolf, Greely's Gypsy, Old Sneak, Ritenbenk and Disco King as well as Peary's king of the team Nalegaksoah.

Told in an engaging manner, supported with lots of sources and notes and illustrations, Nickerson accomplishes her goal of bringing to light the plight, duty, heroism, tragedy, daily life, loyalty and importance of naming these animals referred to as "camels of the north". She expands her discussion of polar dogs to include expedition pets (both dogs and others), dog harnesses, Greenland dog pedigree and ancestry, and dog sledges or sleds (as well as an examination of the difference between the two terms). Dog diets and diseases in addition to dog treatment while in the high latitudes (both cruel and loving) all help provide a well-rounded portrait of this often overlooked topic. With notes and sources, and a good bibliography and index, Sheila Nickerson's *Harnessed to the Pole: Sledge Dogs in Service to American Explorers of the Arctic, 1853-1909* is well worth the read and should be on the shelf of any polar enthusiast. ¶



Kiska: The Japanese Occupation of an Aleutian Island

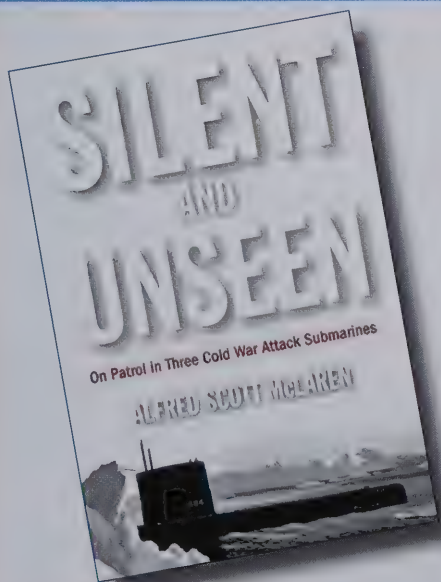
by Brendan Coyle

Fairbanks: Snowy Owl Books, 2014

(\$45.00) ISBN 978-1-60223-237-2

Reviewed by Charles H. Lagerbom

Published by Snowy Owl Books, an imprint of the University of Alaska Press, Brendan Coyle's *Kiska: The Japanese Occupation of an Aleutian Island* is a visual tour-de-force of the largely unknown invasion, occupation and battles for the Aleutian Islands of Attu and Kiska. It grabs the reader from the start with its cover photo of a rusted, partially sunken Japanese ship in the mists of an Arctic morning. Coyle spent over fifty days on Kiska as part of a scientific research team, investigating rodents on the island. But it was the presence of the haunting remnants of rusted and abandoned machinery of war that caught his attention and his camera. What emerges from his wide-ranging forays around the island, along its shores and into its inland spaces is a thoughtful, historical odyssey about a remote time and place that witnessed first-hand the horrors of a modern war. The book is filled with evocative photos of the wildness and harshness of this remote corner of the planet and how this wind-swept remoteness was shattered in the brief "summer" of 1942 with the invasion of Japanese Imperial Army and Navy units. With many eye-catching choices for illustrations of Arctic wildflowers and stunning scenery juxtaposed with remnants of the Japanese war machine, Coyle also makes good use of actual WWII photographs of the invasion and thirteen-month occupation. The well-written text provides an easy-to-read context that helps transport the reader to this eerie, forbidding speck of an island in the treacherous Bering Sea in both the present time as well as seventy-some years earlier. The sad fate of the Aleuts from Attu is wrenching to read, most died of malnutrition in Japanese labor camps. We learn that upon their arrival, Japanese forces also mistreated the only two American inhabitants on Attu, a married couple, Foster and Etta Jones. He was the weather observer and she was the local school teacher. Foster was executed with a bullet to the head during interrogation and Etta was harshly beaten with rifle butts. She spent the next thirty-nine months in brutal labor and internment camps. Brendan Coyle has done us an incredible favor. He has succeeded wonderfully in bringing to life a remote corner of the sub-Arctic world and a forgotten moment in its time. ¶



COMING IN SPRING 2015

Silent and Unseen: On Patrol in Three Cold War Attack Submarines

by Alfred Scott McLaren

The Naval Institute Press

256 pp. \$39.95 (hardcover)

ISBN: 978-1-61251-845-9

Capt. Alfred McLaren describes in riveting detail the significant events that occurred early in the Cold War during his seven years—1958-1965—on board three attack submarines: the USS *Greenfish* (SS 351), the USS *Seadragon* (SS 584, and the USS *Skipjack* (SSN 585). He took part in the first submerged transit of the Northwest Passage; a Baffin Bay expedition; and, as commander of USS *Queenfish* (SS 651), a North Pole expedition that completed the first survey of the entire Siberian Continental Shelf. McLaren's stories and anecdotes offer a look at the development of attack-boat tactics and under-ice exploration techniques. ¶

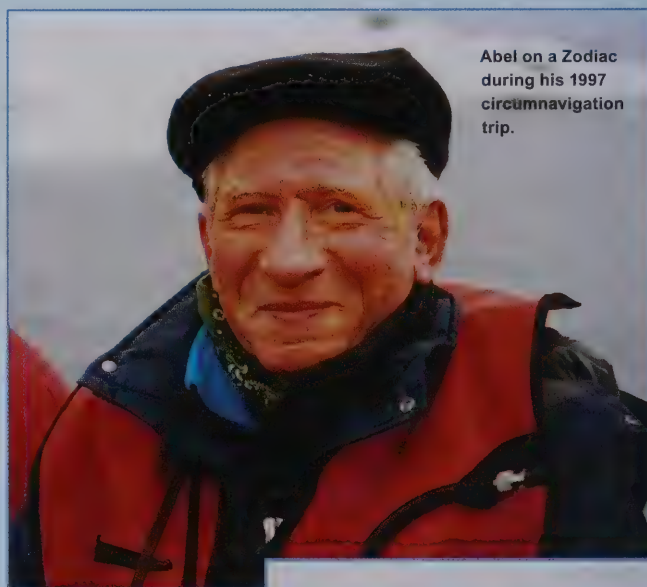
The Passing of Abel Shafer

It is with great sadness that we inform the membership of the passing of Abel Shafer. He died 15 October 2014 in New York City of complications from pneumonia. He was three weeks short of celebrating his 97th birthday.

Abel was a long-time member of the American Polar Society and a contributing editor to *The Polar Times* for the past 14 years.

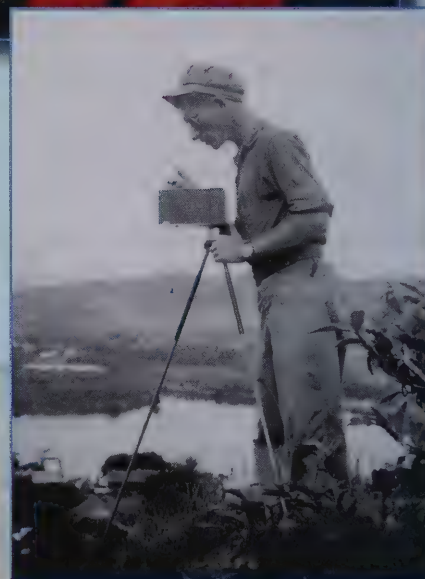
A world traveler, he found his way to many a strange and exotic destination long before strange and exotic travel became a feasible and popular activity. But a cruise to the Antarctic in 1980 triggered what can fairly be said as his addiction to the cold continent. As the years passed, he returned many times on cruise ships and counted as the highlights of his Antarctic experiences two separate circumnavigations of the continent aboard the Russian icebreaker *Kapitan Klebnikov*.

In 1996-97, John Splettstoesser was a lecturer on *Kapitan Klebnikov* where he met Abel and recalls that when Abel had any free time, he could always be found at his favorite location on the ship, as far forward on the bow as was possible, a cigar in hand and watching with fascination as the ship plowed and wended its way through the ice.



Abel on a Zodiac during his 1997 circumnavigation trip.

Photo by Lars and Eric Westman



A younger Abel as a member of the Seabees, in either the Philippines or New Guinea.

Courtesy of Wendy Burton



Abel at St. Lawrence Island in the Bering Sea, Northwest Passage, 1991.

Courtesy of Wendy Burton

Abel, we're told by his niece, photographer Wendy Burton, is on his final voyage. He was cremated, and his ashes have been taken to sea.

As a contributing editor, Abel kept a weather eye on newspapers and scientific periodicals for news and information on any subject involving the Polar Regions. Many, many of his clippings reached the pages of *The Polar Times*.

Abel attended all of the symposiums conducted by The American Polar Society, and he will be sorely missed when we convene once again in November 2015. ¶

OBITUARIES

Danny L. Foster

Danny L. Foster, 77, a former Loudonville resident, died peacefully at his home in Sarasota, FL on Tuesday, October 14, 2014.

Danny was born in Loudonville, on August 20, 1937, and was the son of the late Carl and Thelma Foster. He was a 1955 graduate of Loudonville High School and shortly thereafter joined the US Navy where he became interested in meteorology. He ventured on assigned treks to the Arctic and Antarctica where he was involved in international meteorological research. In November, 1962, the goal of a lifetime was achieved when Danny arrived in Vostok, the coldest place on earth. Three Australians, one American (Danny), and a New Zealander, traveled over 900 miles of uncharted territory known as the Antarctic Plateau. A book entitled "The Coldest Place on Earth" by Robert Thomson detailed their expedition where temperatures reached 100 degrees below zero.

Danny went on to earn a Bachelor's Degree in Engineering from the University of Michigan and served for most of his career as head of Overseas Operations for the National Weather Service, NOAA. In that position he traveled throughout the world assisting other nations to take the much needed weather observations which were critical for predicting weather in the United States, particularly hurricane forecasting, especially in the days before satellite imaging. He was well respected throughout the Americas, Europe, Asia, and Africa, receiving many honors for his vital work.

In addition, Danny personally mentored others, both overseas and in the NWS, providing higher education for select individuals who later became leaders in their countries. He served as Chairman of the Geneva-based World Meteorological Organization's Technical Assistance Program for many years and was instrumental in coordinating agreements between nations. Danny was well loved by his colleagues as well as heads of nations throughout the world and will be sorely missed by the nations and international organizations he helped.

Beyond his professional career, he was an accomplished pianist and avid Ohio State football fan. ¶

Richard (Dick) Maitland Laws

Dick Laws was a zoologist, with both his bachelors' and Ph.D. degrees from the University of Cambridge, England. He spent the late 1940s studying the ecology of elephant seals on South Georgia and the South Orkney Islands, where he had to construct his own laboratory from timbers from a derelict Norwegian whaling station. During a two-year stint on Signy Island, he was base leader, magistrate and postmaster. After spending a season as whaling inspector, he joined the UK's National Institute of Oceanography where he studied whales. After a spell in Africa in the early 1960s, he joined the British Antarctic Survey in 1969 as Head of the Life Sciences Division. He was appointed Director of

BAS in 1973 and held that position until retirement in 1987.

When BAS was experiencing budget cuts, the war in the Falklands in 1982 was a major factor in reviving the work by U.K. in Antarctica when Margaret Thatcher saw the need for additional funding for research. His work for SCAR began in 1972 as a member of the Biology Working Group, becoming Chair in 1980. As the UK delegate to SCAR from 1984 to 1991, he became SCAR President in 1990. Laws Glacier on Coronation Island in the South Orkney Islands is named for him. He was born on 23 April 1926 in Northumberland, and passed away on 6 October 2014 at age 88. ¶ *From BAS and SCAR announcements.*

Bernard Lettau

Bernard Lettau, Program Director and Manager for 31 years before retiring in 2007, died 14 December 2013 at age 75. He was born in Leipzig, Germany, and moved to the U.S. at age 10, became a U.S. citizen in 1955, and was a 1959 graduate of Yale University. He received a doctorate in meteorology from the University of Wisconsin in 1966. He began working at the National Science Foundation in 1976, spending his career as Program Manager for Polar Ocean and Climate Systems in the Office of Polar Programs. Before that, he was an Assistant Professor of atmospheric science at State University of New York at Albany. Lettau Peak (77° 57'S, 162° 29'E) in the Royal Society Range is named for him. ¶ *Megan McDonough, The Washington Post*

Gregory Majerus, Jr.

Gregory "John" Majerus Jr., 74, of Altura, Minnesota, died June 2, 2014, at Gundersen Lutheran Medical Center in La Crosse, Wisconsin.

John was born July 11, 1939, and lived in several locations in the area of Winona, Minnesota, before moving to Altura. He worked as a welder/fabricator at McMurdo Station, Antarctica from 1991 to 2005. Mt. Majerus (77°16'S, 161°38'E), in the area of the Dry Valleys, was named for him and also to acknowledge what evolved as a 'family affair' of the Majerus family of four individuals who worked in the McMurdo area from 1980 to 2005. John was there for 15 seasons, Nicolas for 13, Michelle for 10, and Nicole for 4. ¶

Bruce T. Malfait

Bruce was born March 4, 1947, in Tacoma, Washington, and died May 9, 2014, in Alexandria, Virginia. Bruce graduated from Tacoma's Mount Tahoma High School, graduated from Stanford University, and earned a Ph.D. in marine geology from Oregon State University. He joined the U.S. National Science Foundation in 1974, was Program Director for the Ocean Drilling Program, 1987-2001; Head, Geosciences Section of the Division of Ocean Sciences, 2001-2006, and was responsible for the U. S. management of the Ocean Drilling Program when he retired in 2006. He was an early U.S. architect of the transition to the international Integrated Ocean Drilling

Program. In recognition of his accomplishments facilitating ocean research, a mountain peak in Antarctica was named Mount Malfait (73°05'S, 168°09'E), Victoria Land, by the U.S. Board on Geographic Names. An avid fly fisherman, he greatly enjoyed tying flies and exploring the rivers, fishing rod in hand. ¶ *The Washington Post, June 8, 2014*

James (Robbie) Robbins

James Robbins was born 28 April 1926 and died 12 July 2014. He was in the U.S. Navy during Operation High Jump as radar man on the PBM Mariner flight to Thurston Island on 30 December 1946 when the aircraft crashed in a blizzard. Nine men were on the mission, only 6 returned, rescued 13 days later by aircraft from USS *Pine Island*. The three men at the crash site remain buried with the aircraft wreckage under some 150 feet of snow cover. The general location of the wreckage has been determined, and several attempts to recover the bodies have been discussed, but the situation remains unchanged. ¶

Elias "Al" Joseph Stetz

Elias Stetz, former U.S. Navy pilot who flew in Antarctica, died 19 July 2014 at age 81, in Locust Valley, New York. Lt. Stetz was one of the pilots of the P2V Neptune that crashed at Wilkes Station on 9 November 1961, killing 5 people. Four survivors suffered burns. The flight originated at McMurdo, went to Mirny Station, then to Wilkes for refueling. The mission included Dr. Edward Thiel, geophysicist in the U.S. Antarctic Research Program, who died in the crash and was conducting a magnetometer survey of Antarctica. Stetz and the other pilot, plus two others, survived the crash. The crash occurred during takeoff from Wilkes, with fire developing from a leaking fuel tank with fuel igniting from the use of Jato. Stetz later flew reconnaissance missions over Soviet air space during the cold war out of Turkey, and flew in Viet Nam in 1965-66. He retired from the Navy in 1979. ¶

Bernard Stonehouse

Bernard Stonehouse, a well-known polar scholar and scientist died 12 November 2014 at age 88.

Dr. Bernard Stonehouse had a varied career in polar regions, starting with the Falkland Islands Dependencies Survey (FIDS) at Stonington Island (Base E) in the 1940s. He was perhaps best known as a biologist, but at various times was also in the Royal Navy, a pilot, meteorologist, dog-sledger, writer and educator. He was born on 1 May 1926, and was for many of his adult years was associated with the Scott Polar Research Institute (SPRI), University of Cambridge, England. A major part of his career was as an environmentalist, with research on impacts of polar tourism. As mentor and adviser to numerous students under his supervision at SPRI, students received MPhil and PhD degrees on polar subjects. Tourist vessels visiting Cuverville Island in the Antarctic Peninsula might have been fortunate to observe his students in "Project Antarctic Conservation" that he originated,

APS CHANGES Since December 2013

- Online (includes PayPal) ■ Ant Con
- Gift ■ Other

New members

- Ike Johnson (Warren, ME) Nov 2013
- Richard Alvord (Edgewater, FL) Dec 2013
- Lawrence May (Hastings on Hudson, NY) Dec 2013
- Frank Donnelly (Staten Island, NY) Dec 2013
- R.A. Jensen (Carbondale, IL) Jan 2014

- Michael Tomlinson (Flagstaff, AZ) Jan 2014
- Jackie Dorosky (Feasterville, PA) Jan 2014
- Bill Hutson (Little Compton, RI) Jan 2014
- Anthony Fiorillo (Dallas, TX) Jan 2014
- Brendan Coyle (Canada) Feb 2014
- Antonia Chambers (Vienna, VA) Feb 2014
- Gregory Miller (Redding, CT) March 2014
- Thomas Eley (Anchorage, AK) March 2014
- Laurence Seaton (Napa, CA) March 2014

- Jonathan Paz y Mino (NY, NY) March 2014
- Bruce MacNab (Pioneer, CA) April 2014
- Howard Sargent (Boulder, CO) May 2014
- Michael Warren (Forest Knolls, CA) June 2014
- Valene Lucy Smith (Chico, CA) June 2014
- Victoria Wheatley (San Diego, CA) Aug 2014
- Stephen Harding (Portland, ME) Aug 2014
- Adrian Howkins (Longmont, CO) Nov 2014

APS members and those of the polar community held in remembrance:

Allen, Kenneth William
Braxton, Dorothy
Cromie, William
Entriakin, Joe
Foster, Danny L.
Fridovich, Bernard
Grass, Robert D.
Huffman, Jerry
Hunkins, Ken

Kauders, Patricia
Klick, Donald W.
Knauff, Robert A.
Laws, Dick
Lettau, Bernhard
Malfait, Bruce T.
Matsch, Charlie Leo
Mowat, Farley
Nichols, Cdr Robert L. Nichols (USN-Ret)

Philip, Kenelm "Ken"
Porter, Charles Porter
Robbins, James (Robbie)
Segers, Chester W.
Shafer, Abel
Stetz, Elias
Swithinbank, Charles
Tickell, Lance

(CONTINUED FROM PAGE 37)

conducting studies on the gentoo penguin colony and skua populations that lived there. Stonehouse authored many books on polar subjects, including biology and an encyclopedia, articles on his research, and was also Editor of *Polar Record*. He was present in Antarctica for essentially every year either as a researcher or as lecturer on tour vessels. *Polar Record* published an excellent summary of his career in an article by Liz Cruwys and Beau Riffenburg, vol. 36, no. 205, p. 157-169, 2002. ¶

Lance Tickell

William Lancelot Noyes ('Lance') Tickell died 10 June 2014, after many years of research on Antarctic and sub-Antarctic birds, particularly albatrosses. He was born in Coventry on 21 October 1930, and after a stint in the army, attended University College of North Wales at Bangor, earning a degree in botany and zoology. He served with the Falkland Islands Dependencies Survey (FIDS) in 1954, with an assignment at Signy Island in 1955-56. His work at that time resulted in a MSc degree on the subject of the Antarctic prion. He also spent much time at Bird Island -- in 1960-61 working on a project funded through the U.S. Antarctic Research Program. He wintered on Bird

Island in 1963. He was at Johns Hopkins University in 1964, receiving his doctorate on the great albatrosses. In 1969 he traveled to East Africa, giving lectures at universities in Kenya, Uganda, Malawi, and Lesotho. His numerous papers on albatrosses culminated in his book on the subject, published in 2000. He was also known as a TV Producer for a BBC Natural History Unit, contributing to the series "Life in the Freezer." Tickell Peak on Bird Island is named for him. ¶

James Quincy Tierney-Holly

James Quincy Tierney-Holly, "JQ" or Jay to his friends died in Sykesville, Maryland on the 18th of August, 2014. JQ was 89 years old.

JQ was born in Los Angeles and got a BSc. and did graduate work at the University of Miami. Although accepted to medical school at Tulane he decided to pursue his love of marine biology and oceanography and took a job with the US Navy.

Before and during the International Geophysical Year he served on most of the US Navy and Coast Guard's icebreakers in the Antarctic. He started on the *Atka* in the Ross Sea during the pre-IGY reconnaissance to site the McMurdo air base and Little America V. He went on to work for years as

an oceanographer in both the Arctic and Antarctic. Much of his biological work is now housed at the Smithsonian's Museum of Natural History.

As an oceanographer for the US Navy, JQ was also later involved in intelligence and undersea warfare work. His work in this field has been recognized by the Secretary of the Navy and the US Arms Control Agency. He was involved with but not onboard the USS *Pueblo* when the North Koreans took it. He said that several of his friends whom he had sent on the ship "bore him no ill will" after they were repatriated!

On one of his Antarctic cruises the ship he was on was badly damaged in the ice, requiring dry-docking in Wellington, New Zealand. There he met and later married Beverley Toon, his wife for 42 years until her untimely death in 2002. They lived near Washington, DC, except for a few years after retirement when they returned to New Zealand. Finding New Zealand "too insular," they returned to the US and retired in rural Maryland.

JQ held the US Antarctic Service Medal, was a member of the Antarctic Society and a Fellow of the Explorers Club. The Tierney Peninsula on what is now Thurston Island (then the Thurston Peninsula) was named for him as a member of the 1960 Burton Island cruise to the area. ¶

About Our Cover: Antarctica Mosaic from Space

Our front cover this issue is a mosaic showing a portion of the continent of Antarctica as photographed from space. Our back cover shows all of Antarctica.

You may note the jagged outer edges on both images. These are actually the shapes of the continuous, small, square photographs taken by the satellite. When overlaid, they form a large mosaic that ultimately appears as a complete photograph of the continent. These separate small photographs are not obvious except where the imagery stops, just beyond the shoreline.

In particular, we are featuring the Ellsworth Mountains. The mountains were discovered on a trans-continental flight by Lincoln Ellsworth in 1935, starting from Dundee Island, near the tip of the Antarctic Peninsula, to Little America. The mountains consist of two major parts, the Sentinel Range (north) and Heritage Range (south), separated by Minnesota Glacier.

Sentinel Range includes eight of the 10 highest peaks in Antarctica, with Vinson Massif the highest at 4,892 meters (16,046 ft), located at 78°35'S, 85°25'W.

The area was first visited and mapped by a field party from the University of Minnesota in the 1961-62 austral summer.

Our thanks to Julie Friddell of the Polar Data Center/Canadian Cryospheric Information Network for her guidance in helping us retrieve these images from their vast RADARSAT-1 and RADARSAT-2 image libraries.

These and thousands of other RADARSAT images of Antarctica and the Canadian Arctic are available for free download at the Polar Data Catalogue, <https://www.polardata.ca/pdcsearch/>. For assistance, contact Julie via email at PDC@uwaterloo.ca. ¶ (See the inside front cover for mosaic image copyright information.)

We've Missed You: Should We Be Worried?

We've written asking you to support, with a contribution of \$80 or more, the American Polar Society's 80th Anniversary Symposium, "The Polar Oceans and Global Climate Change," convening at Scripps Institution of Oceanography, La Jolla, California, November 3 to 6, 2015. But we haven't yet heard back from you.

Please take a moment, while you have this reminder in your hand, to make your contribution. We need you!

Maybe I haven't said strongly enough—as strong as it must be said—that we can't launch this world-class event without the support of our members—without *your* support.

Your support is meaningful. It's my guess that you joined the APS in the first place because of your deep affinity for the frontier of the high latitudes and your interest in sharing new knowledge about this special region and preserving its unique vistas. I'm asking you now to step forward and give hearty support to the purposes for which the APS was founded:

- to provide a means of fostering interest in research and exploration in the Arctic and Antarctic;
- to preserve the record of polar research and exploration; and
- to support and encourage research and exploration in polar and polar-like regions.

Your support is the path to action. By contributing to our Symposium, you are part of a select group of doers—not dreamers, but *doers*: a group that can literally reach across the

world to assemble, at La Jolla, such esteemed authorities as Norman Augustine, retired CEO of Lockheed-Martin and former Chair of the President's Blue-Ribbon Panel on the U.S. Arctic Program; our own Dr. Lawson Brigham, Distinguished Professor of Geography and Arctic Policy at the University of Alaska; Dr. Sylvia Earle, famed ocean environmentalist; sea ice expert Dr. Peter Wadhams of Cambridge University; Dr. Julian Dowdeswell, Director of the Scott Polar Research Institute; and Dr. Claire Parkinson, Climate Change Senior Scientist at NASA—and to focus attention on their insights and discoveries.

To be successful in raising money from outside sources, we need to demonstrate to potential foundation and corporate funders that our board and members stand squarely behind the Symposium and are backing it to the greatest extent possible. All this is to say that **your support is critical.**

So, please make your donation today. Convince us that we have no need to worry.

Contributing is easy. Just go to our website, www.americanpolar.org, and donate \$80 or more through PayPal, or send a check made out to the American Polar Society, addressed to APS Treasurer Ed Varney at 45 Woodacres Drive, Northport, ME 04849. APS is classified as a tax-exempt organization under Sec. 501(c) 3 of the IRS Code, which means your contribution will qualify as a tax deduction.

Feel free to contact me directly if you would like to discuss our program at the Scripps Symposium. I can be reached via e-mail at alfredsmclaren@aol.com, or by phone

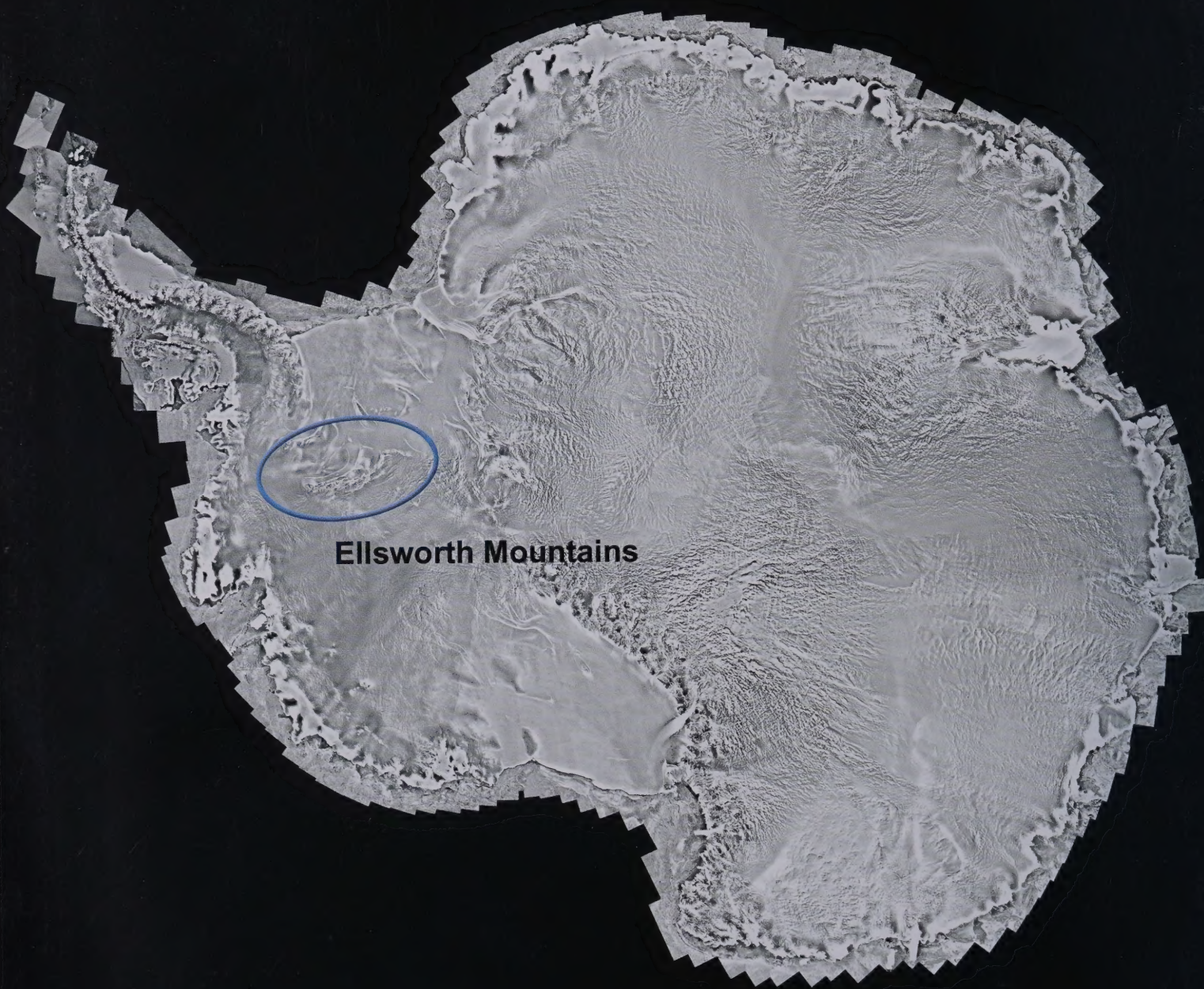
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(303) 447-0608 or cell (646) 352-2614. I'm open to your suggestions.

Thank you for your timely contribution!

Alfred S. McLaren
Captain, USN (Ret.), Ph.D.
President, APS



A close-up view of the continent of Antarctica, as seen from space, with the Ellsworth Mountains as a reference point. (The jagged edges, evident along the coastline, are the shapes of the numerous individual satellite photos that make up the complete image.)